User's
Manual

FieldMate R3.01
AXF Verification Tool R1.01

AXF
Verification Tool

IM 01R01A11-01EN

vigilantplant®

YOKOGAWA
Yokogawa Electric Corporation

IM 01R01A11-01EN
2nd Edition

AXF
Verification Tool

IM 01R01A11-01EN 2nd Edition

CONTENTS

1 INTRODUCTION 1-1
1.1 About This Manual 1-2
1.2 Safety and Modification Precautions 1-2
1.3 Trademarks 1-3
1.4 Software License Agreement 1-3
2 OUTILINE 2-1
2.1 Configuration 2-2
2.2 Verification Item 2-3
2.3 Operation Procedure 2-4
3 PREPARATION 3-1
3.1 Package and Installation 3-2
3.2 AXF Write Protect Cancellation 3-2
3.2.1 Before Verification 3-2
3.2.2 During Verification 3-3
4 START-UP FROM FieldMate 4-1
4.1 From “Segment Viewer” (AXF is reading in “online” mode in FieldMate) 4-2
4.2 From “Device Navigator” 4-4
4.3 From “Verification Data” in “Device Maintenance Info” 4-6
5 LAUNCHING 5-1
5.1 Creating New Verification Data 5-2
5.2 Loading Existing Verification Data 5-4
5.3 After Unexpected Termination 5-4
6 OPERATION 6-1
6.1 Main Screen 6-2
6.1.1 Load 6-3
6.1.2 Save 6-4
6.1.3 Print out 6-8
6.1.4 Menu bar 6-9
6.2 Standard VF 6-11
6.2.1 “Circuit” check and “Device Status” check (Verification Tool is in “online” mode) 6-12

All Rights Reserved, Copyright © 2012, Yokogawa Electric Corporation

6.2.2 Physical Appearance 6-21
6.2.3 Standard VF Result 6-22
6.3 Enhanced VF 6-23
6.3.1 Current Output 6-24
6.3.2 Pulse Output 6-27
6.3.3 Converter 6-32
6.3.4 Insulation Resistance 6-35
6.4 Result 6-36
7 VARIATION OF VERIFICATION DATA 7-1
7.1 Installation Data 7-1
7.2 Locked Data 7-2
7.3 Others 7-2
8 TERMINATION 8-1
8.1 Normal Termination 8-1
8.1.1 When the verification data has not been changed after saving: 8-1
8.1.2 When the verification data has been changed after saving: 8-1
8.2 Unexpected Termination 8-2
9 COMMUNICATION ERROR 9-1
9.1 Error Message 9-1
9.2 Device Address Setting 9-3
9.2.1 Multidrop Mode Canceling 9-3
9.2.2 Multidrop Mode Setting 9-3
Revision Information 1

1 INTRODUCTION

This User's Manual gives instructions on "AXF Verification Tool".

This software is used to set up magnetic flowmeter AXF; therefore, it is indispensable for users to read, understand and follow the instructions on all the following user's manual before actually starting the operation.

Table 1.1.1 User's Manuals for magnetic flowmeter ADMAG AXF

Title	IM No.
AXF Magnetic Flowmeter, Integral Flowmeter/ Remote Flowtube [Hardware Edition]	IM 01E20D01-01E
AXFA11G Magnetic Flowmeter, Remote Converter [Hardware Edition/Software Edition]	IM 01E20C01-01E
AXFA14G/C Magnetic Flowmeter Remote Converter [Hardware Edition/Software Edition] AXF Magnetic Flowmeter Integral Flowmeter [Software Edition]	IM 01E20C02-01E

Table 1.1.2 User's Manuals for external instruments

Title	IM No.
Models AM012 Magnetic Flowmeter Calibrator	FY2-XJAM012-40-2E
CA150 HANDY CAL	IM CA150E

Refer to FieldMate User's Manual when using AXF Verification Tool.

Table 1.1.3 User's Manuals for FieldMate

Title	IM No.
FieldMate Versatile Device Management Wizard	IM 01R01A01-01E
FieldMate Operational Precaution	IM 01R01A01-91E
FieldMate Wizard Getting Started	IM 01R01A04-01E

1.1 About This Manual

- This manual should be provided to the end user.
- Before using the AXF Verification Tool, read this manual thoroughly to comprehend its contents.
- The contents of this manual may be changed without prior notice.
- All rights are reserved. No part of this manual may be reproduced in any form without Yokogawa's written permission.
- Yokogawa makes no warranty of any kind with regard to this material, including, but not limited to, implied warranties of merchantability and suitability for a particular purpose.
- All reasonable effort has been made to ensure the accuracy of the contents of this manual. However, if any errors or omissions are found, please inform Yokogawa.
- Yokogawa assumes no responsibilities for this product except as stated in the warranty.
- Please note that this user's manual may not be revised for any changes in specifications, construction changes or operating part changes that are not considered to affect function or performance.
- If the customer or any third party is harmed by the use of this product, Yokogawa assumes no responsibility for any such harm owing to any defects in the product which were not predictable, or for any indirect damages.
- This manual describes the operation of the AXF Verification Tool with FieldMate Advance. For detail installation and operation of FieldMate and additional functions, please refer to the FieldMate User's Manual.

1.2 Safety and Modification Precautions

- The following general safety precautions must be observed during all phases of operation, service, and repair of this instrument. Failure to comply with these precautions or with specific WARNINGS given elsewhere in this manual violates safety standards of design, manufacture, and intended use of the instrument. Yokogawa assumes no liability for the customer's failure to comply with these requirements. If this instrument is used in a manner not specified in this manual, the protection provided by this instrument may be impaired.
- Yokogawa will not be liable for malfunctions or damage resulting from any modification made to this instrument by the customer.
- The following safety symbols are used in this user's manual and on the instrument.

WARNING

A WARNING sign denotes a hazard. It calls attention to a procedure, practice, condition or the like, which, if not correctly performed or adhered to, could result in injury or death of personnel

CAUTION

A CAUTION sign denotes a hazard. It calls attention to a procedure, practice, condition or the like, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the product.

IMPORTANT

An IMPORTANT sign denotes that attention is required to avoid damage to the instrument or system failure.

NOTE

A NOTE sign denotes essential information for understanding operations and features.

1.3 Trademarks

All the brand names or product names of Yokogawa Electric used in this document are either trademarks or registered trademarks of Yokogawa Electric Corporation.

All the brand names or product names of other companies mentioned in this document are either trademarks or registered trademarks of their respective holders.

1.4 Software License Agreement

Refer to IM 01R01A01-01E Part A.

2 OUTILINE

AXF Verification Tool is a PC application software running in conjunction with FieldMate R2.05.00 or later.

Without having to remove the AXF magnetic flowmeter from process line, its condition can be verified by checking several items and this tool provides a certificate that the unit is operating in accordance with YOKOGAWA standards. It is essentially an indication that the AXF is operating to its standards and is useful in supporting plant maintenance practices. It differs from actual-flow calibration at a manufacturing plant.

This tool stores verification data (*1) in a database (*2) in an organized manner, and can be used to print a Verification Report that has not only the individual verification items (*3) result but also the overall status of “passed” or “failed”. It is thus useful for device maintenance management.

*1: Verification data means the data saved by the user.
*2: Database means a collection of verification data saved in Device Maintenance Information.
*3: For the verification items, refer to Section 2.2.

2.1 Configuration

The following equipment is required to use Verification Tool ver. 1.01.00;

- YOKOGAWA magnetic flowmeter AXF with HART Communication (AXF Output Signal and Communication suffix code: -E).
- PC (*1) and Printer
- Magnetic Flowmeter Calibrator AM012 (Only for Enhanced VF (*2), Optional)
- Handy Calibrator CA150 or equivalent (Only for Enhanced VF (*2), Optional)
- Insulation Checker (Only for Enhanced VF (*2), Optional)

*1: Regarding the PC environment, refer to IM 01R01A01-01E Part B,C.
*2: VF stands for “Verification”.

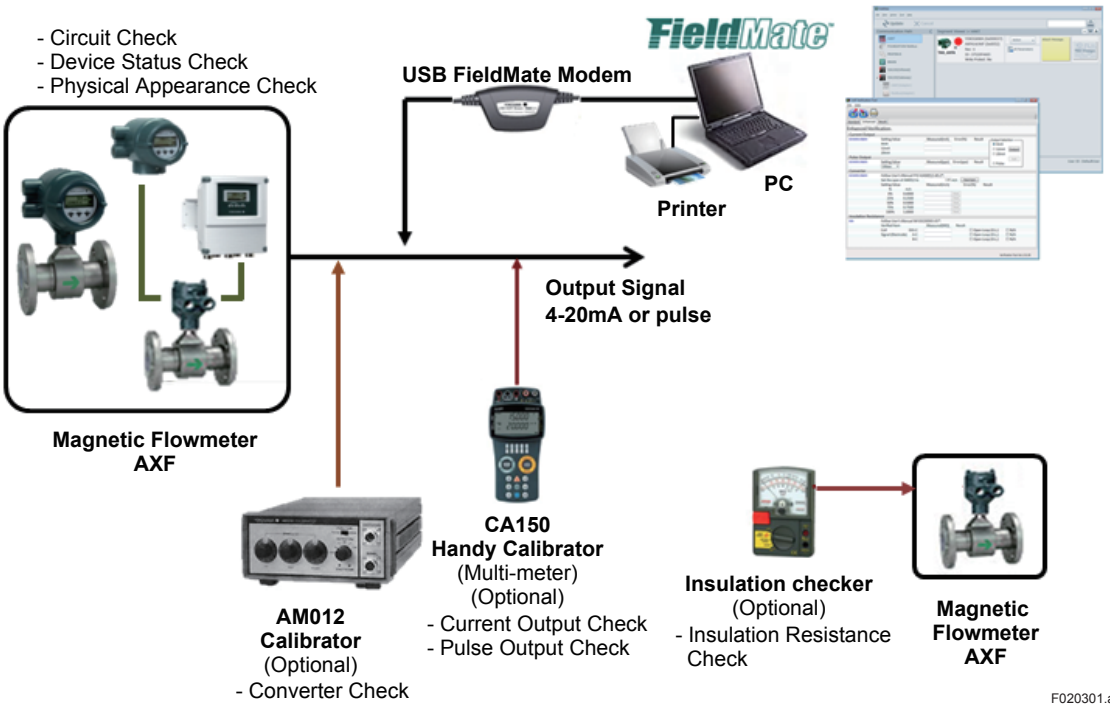


Figure 2.1.1 Configurations

2.2 Verification Item

This Verification Tool has 2 modes, which can be run separately.

1. Standard Verification (Standard VF)

- This mode verifies the condition of the AXF without difficulty by checking its internal parameters. No external instruments are required.
- Some items are run only when FieldMate is in “online (*1)” mode.

2. Enhanced Verification (Enhanced VF) [Optional]

- This mode provides a more reliable verification by performing a detailed overview equivalent to SERVICE.
- This mode is optional. If only this mode is completed, “Overall Status” is left blank.
- This mode verifies AXF by using external instruments, such as Magnetic Flowmeter Calibrator AM012, Handy Calibrator CA150, and so on.
- Even when FieldMate is in “offline (*2)” mode, this mode can be run; in this case, some settings must be made manually.

There are only 2 possible combinations:

1. Standard VF
2. Standard VF + Enhanced VF

Table 2.2.1 Verification Items

Mode	Verification Item	Description
Standard VF	Circuit (*3)	
	Magnetic Circuit	Checks the Magnetic Circuit.
	Excitation Circuit	Checks the Excitation Circuit.
	Calculation Circuit	Checks the Calculation Circuit.
	Device Status (*3)	
	Alarm Check	Checks occurring Alarms.
	Alarm History	Checks historical Alarms.
	Physical Appearance	
	Flowtube	Checks the Flowtube appearance.
	Converter	Checks the Converter appearance.
Enhanced VF	Current Output (*4)	Checks the Current Output.
	Pulse Output (*4)	Checks the Pulse Output.
	Converter (*4)	Checks the Converter Accuracy.
	Insulation Resistance	
	Coil	Checks the Excitation Coil. (Remote Flowtube Only)
	Signal (Electrode)	Checks the Insulation Resistance. (Remote Flowtube Only)

*1: Online: The status in which the software communicates with a device.
*2: Offline: The status in which the software does not communicate with a device.
The communication status between FieldMate and AXF can be confirmed on the FieldMate window.
*3: These items are checked only when Verification Tool is in “online” mode.
*4: When Verification Tool is in “offline” mode, manual setting is necessary.

2.3 Operation Procedure

Figure 2.3.1 summarizes operation procedure.

To complete “Standard VF”, start-up Verification Tool from “Segment Viewer”. See Section 4.1.

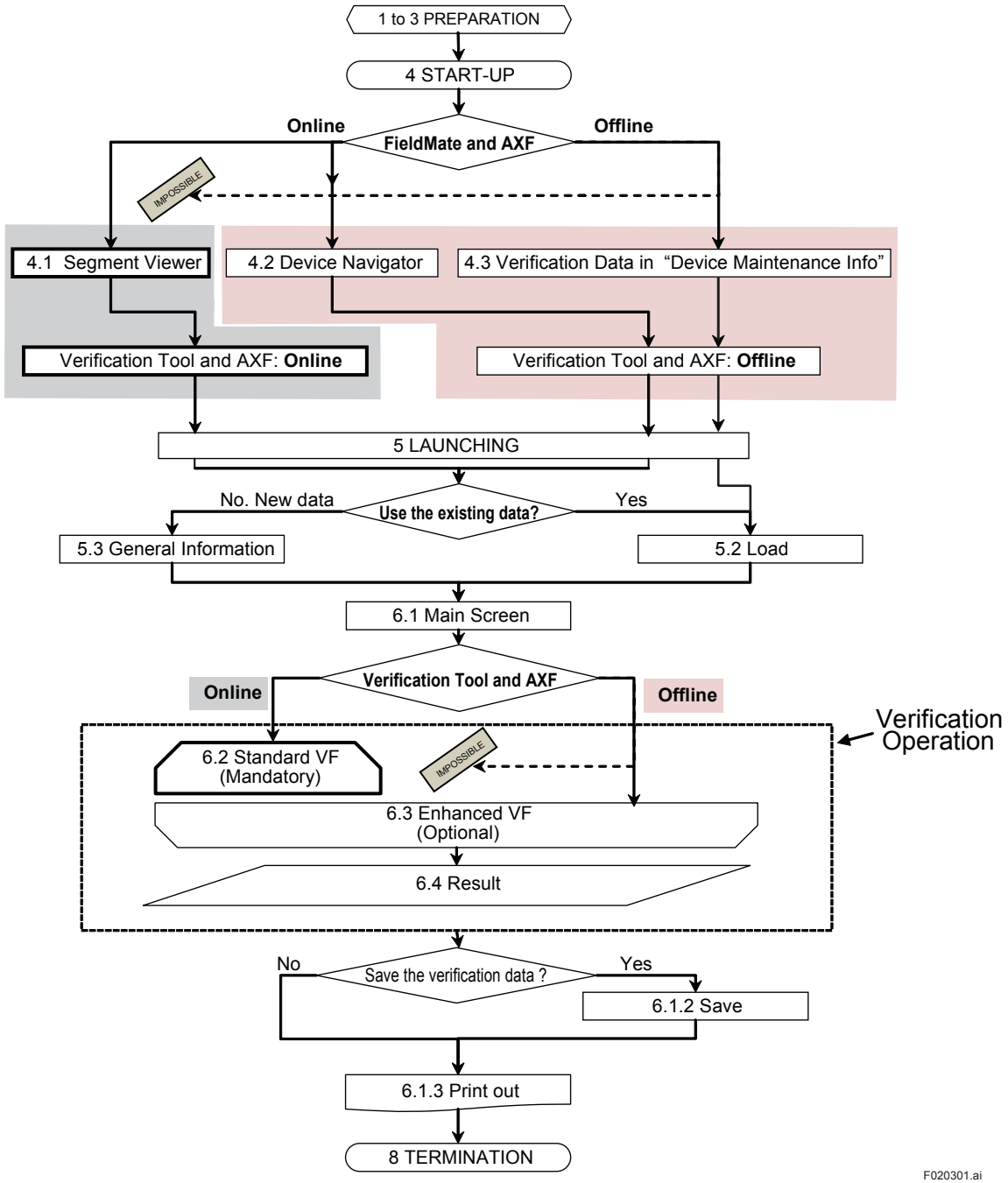


Figure 2.3.1 Operation Procedure

3 PREPARATION

WARNING

- Before running the Verification Tool, loop should be set to manual mode in the host system.
- The following applications may cause inadequate results:
  - Significantly-low flow rate
  - Slurry liquid
  - Stray current
- When “unexpected issue (*1)” occurs while running Verification Tool, follow Section 8.2 “Unexpected Termination” and Chapter 9 “Communication Error”

*1: “Unexpected issue” means disconnection between AXF and PC:
- Physical disconnection between AXF and PC
- Forced shutdown of PC
- Unforeseen AXF power-off

3.1 Package and Installation

Regarding the packaging and installation procedure, refer to IM 01R01A01-01E Part B.

3.2 AXF Write Protect Cancellation

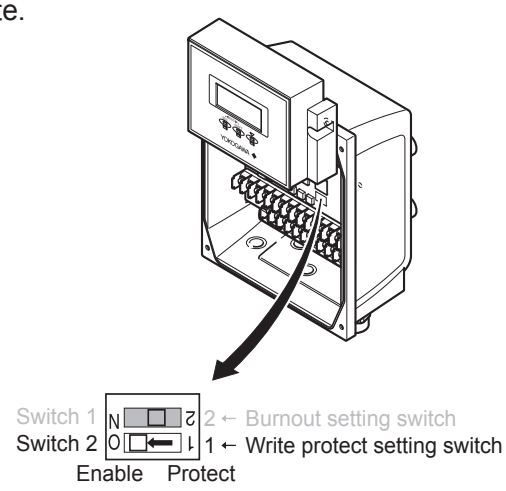
3.2.1 Before Verification

1) AXF parameters are changed during the verification process. Cancel the write protect switch.

(A) AXFA11 Remote Converter

Hardware switch off

Set the "Write Protect Switch" to "Enable" before this verification. Return the switch to the original position after this verification is complete.



(B) AXFA14 Remote Converter or AXF Integral Flowmeter

Hardware switch off

Set the "Write Protect Switch" to "Enable" before this verification. Return the switch to the original position after this verification is complete.

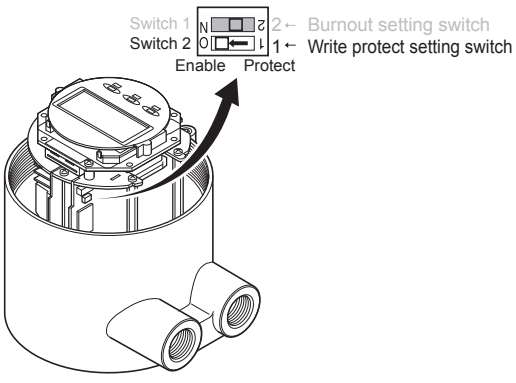
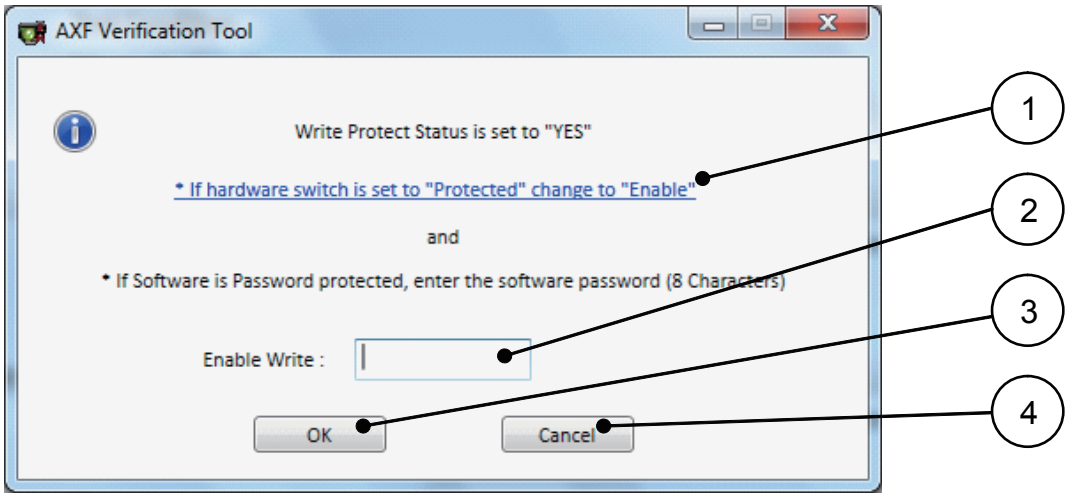


Figure 3.2.1 Write Protect Cancellation

2) After the verification is complete, return the switch to the original position.

3.2.2 During Verification

1) If the AXF write protect function is set to “Protect” during the verification, **Figure 3.2.2** will be displayed.



F030202.ai

Figure 3.2.2 “Write Protect Cancellation” Dialog

Table 3.2.1 “Write Protect Cancellation” Dialog

Item No.	Item Name	Description
1	‘If hardware….’	Shows the figure of hardware switch. See **Figure 3.2.1**. Click the text.
2	Enable Write	Cancels the software protection of the device. Enter the password.
3	OK	Runs the software protection cancellation.
4	Cancel	Cancels ‘**Write Protect cancellation**’

2) Set the “Write Protect Switch” to “Enable” .
Then, enter the password in (2) and click “OK (3)” in **Figure 3.2.2**.

3) Return the switch to the original position after this verification is complete.

4 START-UP FROM FieldMate

Verification Tool can be started by the following:

- From “Segment Viewer” (FieldMate is online to AXF), see Section 4.1.
- From “Device Navigator”, see Section 4.2.
- From “Verification Data” in “Device Maintenance Info”, see Section 4.3.

Select the start-up procedure depending on the items to be verified and connection status between FieldMate and AXF.

NOTE

- To run Verification Tool in “online” mode, start the Verification Tool from “Segment Viewer”.
- To complete Standard VF, start Verification Tool from “Segment Viewer”.

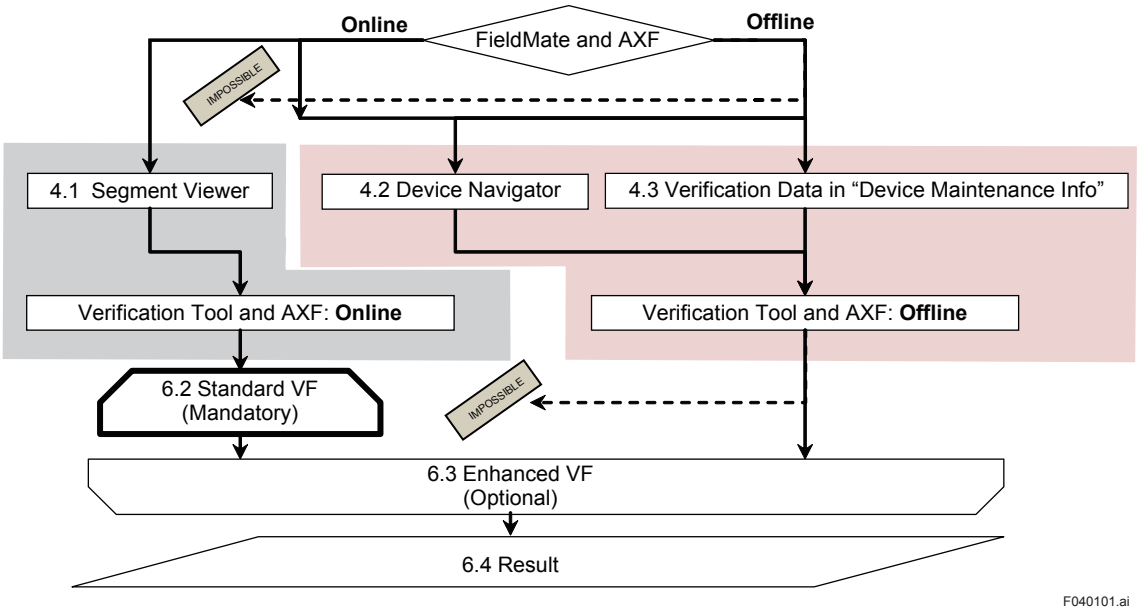


Figure 4.1.1 “Start-up” Procedure

4.1 From “Segment Viewer” (AXF is reading in “online” mode in FieldMate)

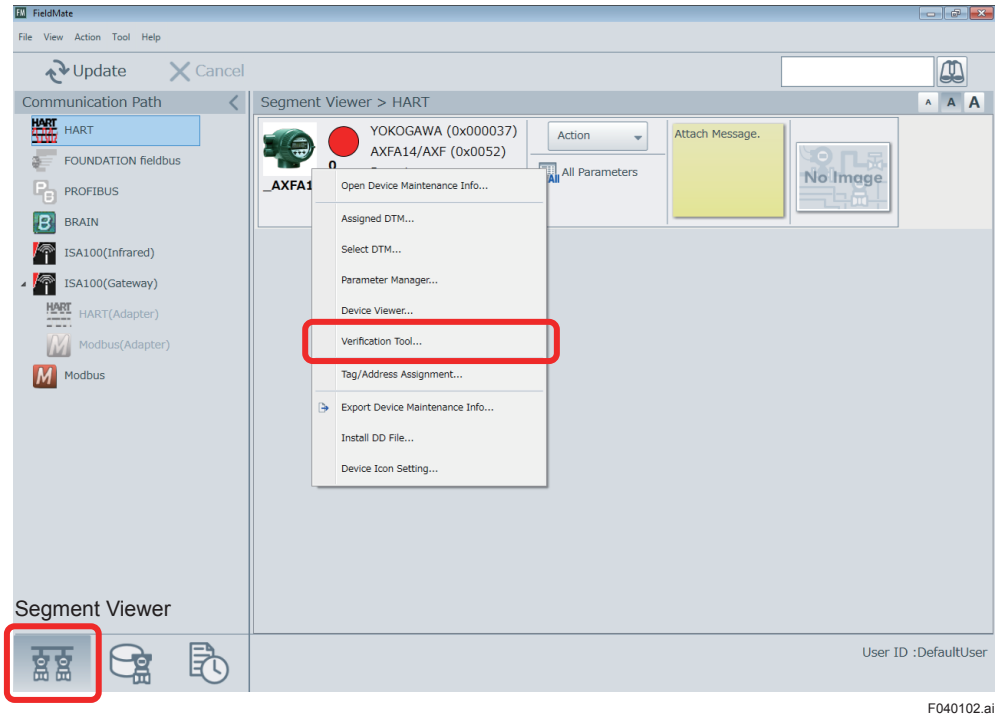
NOTE

Set the device address to 0. Verification Tool can be started only when the device address is set to 0. For details on how to set the device address, refer to Section 9.2.

From “Segment Viewer”, “Verification Tool” can be started by method (A), (B) or (C).

(A) By right-clicking

Right-click on the target (AXF) icon displayed at “Segment Viewer”, and select “Verification Tool”.



F040102.ai

Figure 4.1.2 Start-up from “Segment Viewer” by Right-clicking

(B) By selecting “Action” menu

Select the target (AXF) icon displayed at “Segment Viewer”, and in the “FieldMate” menu bar, select “Action” menu - “Verification Tool”.

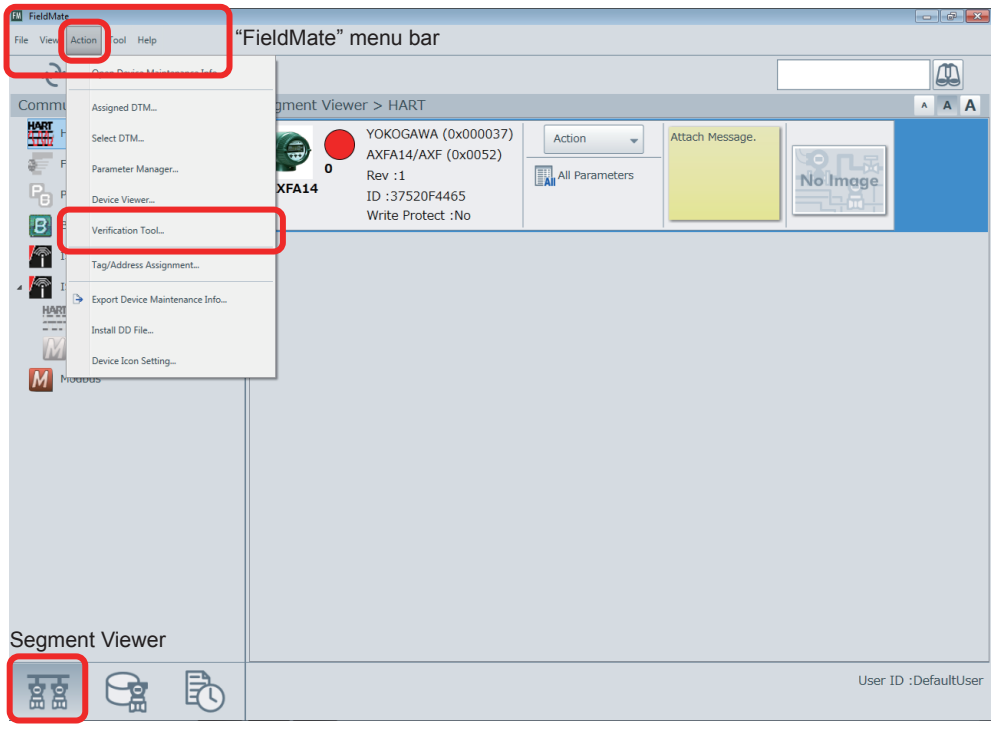


Figure 4.1.3 Start-up from “Segment Viewer” by Selecting the “Action” Menu

(C) By selecting “Action” button

Select the target (AXF) icon displayed at “Segment Viewer”, and select “Action” button – “Verification Tool”.

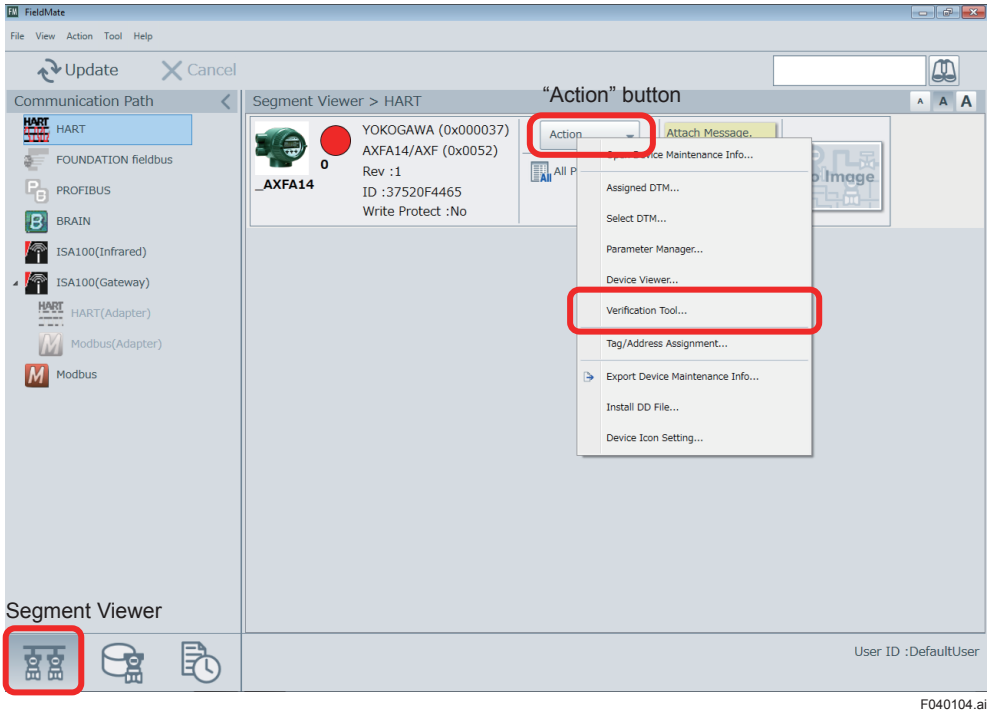


Figure 4.1.4 Start-up from “Segment Viewer” by Selecting the “Action” Button

4.2 From “Device Navigator”

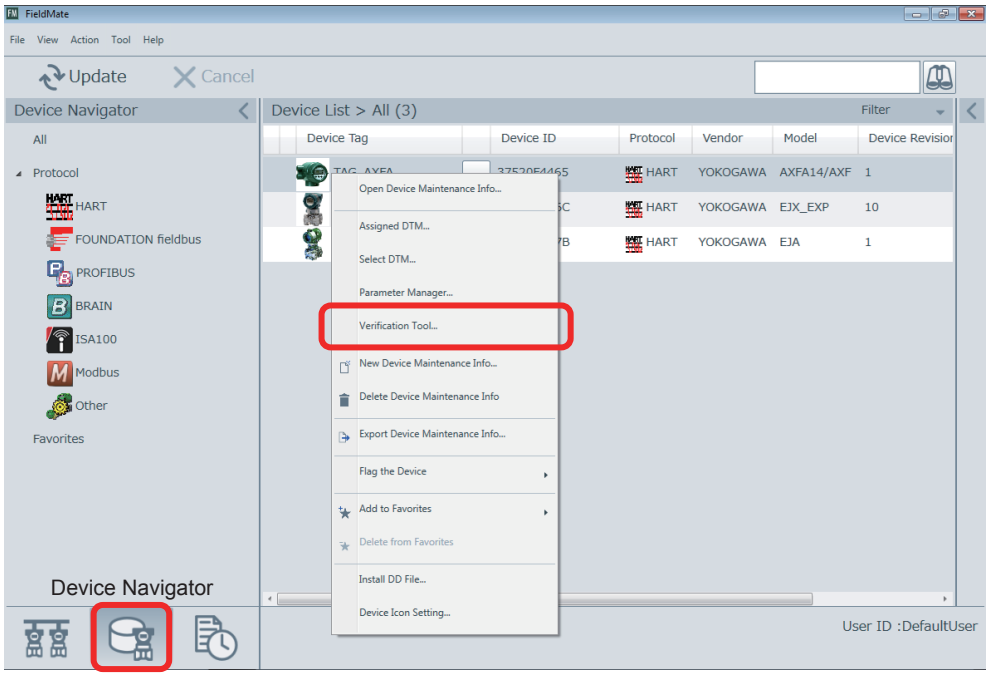
NOTE

When Verification Tool is started from “Device Navigator”, it will be in “offline” mode even if the AXF is in “online” mode in FieldMate.

From “Device Navigator”, “Verification Tool” can be started by either method (A), (B) or (C).

(A) By right-clicking

Right-click on the target (AXF) icon displayed at “Device Navigator”, and select “Verification Tool”.

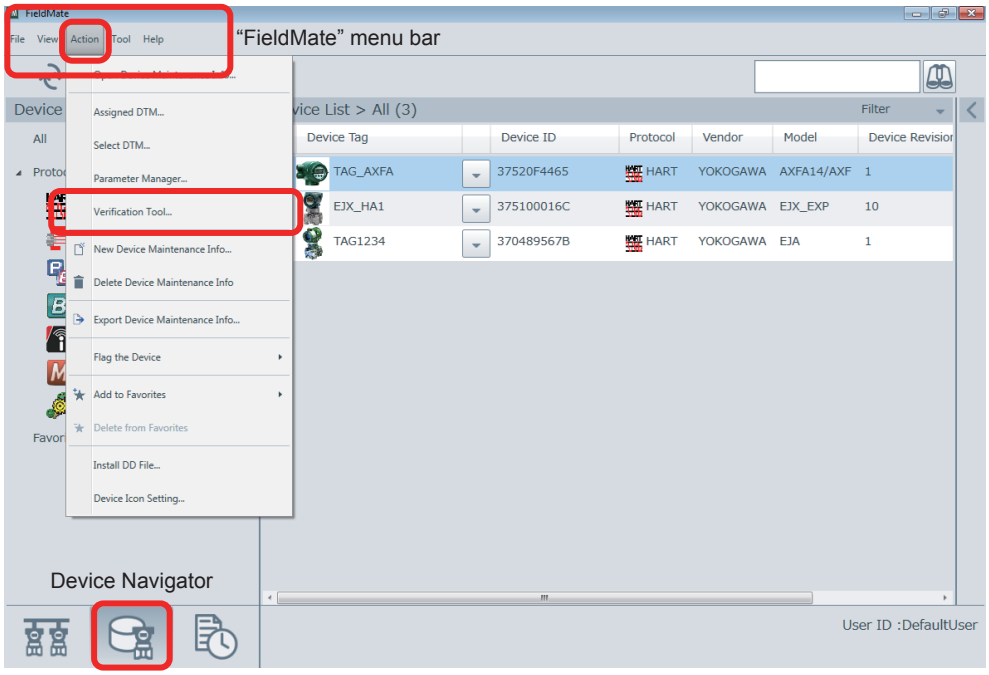


F040201.ai

Figure 4.2.1 Start-up from “Device Navigator” by Right-clicking

(B) By selecting “Action” menu

Select the target (AXF) icon displayed at “Device Navigator”, and in the “FieldMate” menu bar, select “Action” menu – “Verification Tool”.

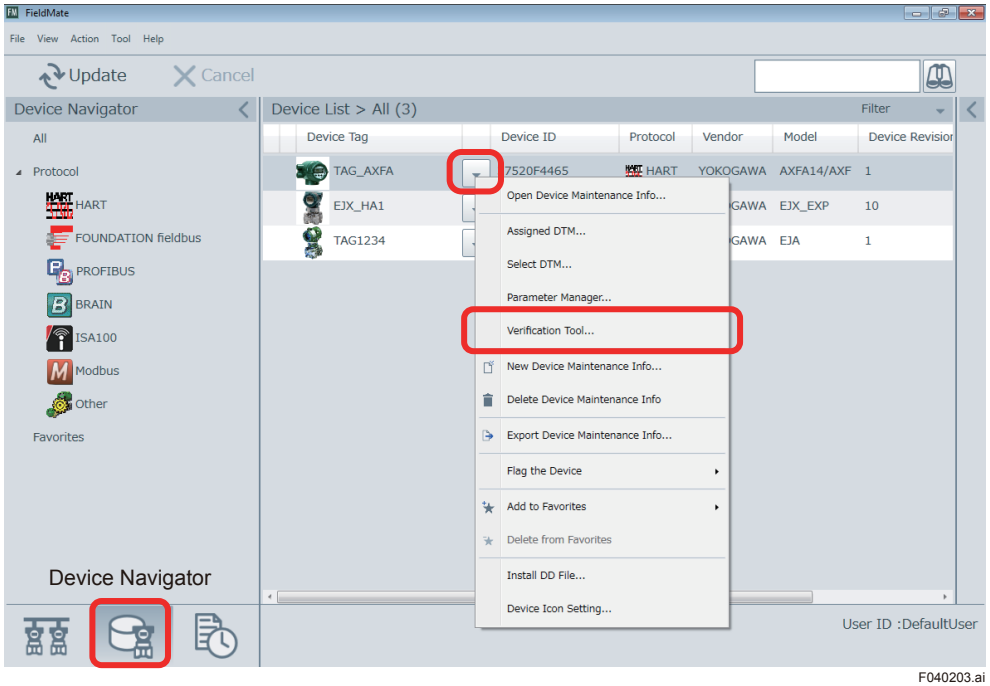


F040202.ai

Figure 4.2.2 Start-up from “Device Navigator” by Selecting the “Action” Menu

(C) By selecting “Action” button

Select the target (AXF) icon displayed at “Device Navigator”, and select “Action” button – “Verification Tool”.



F040203.ai

Figure 4.2.3 Start-up from “Device Navigator” by Selecting the “Action” Button

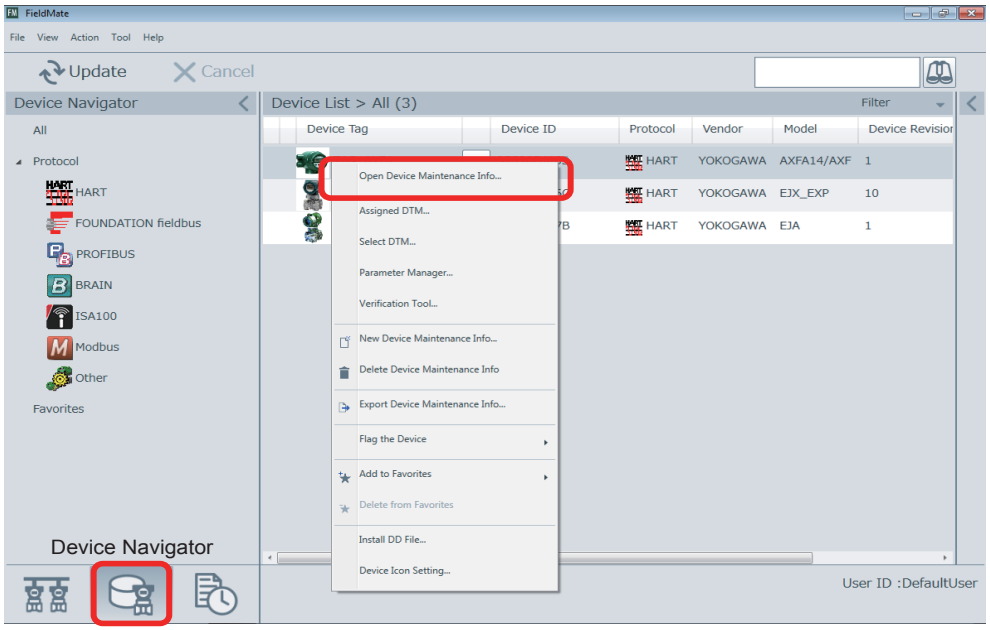
4.3 From “Verification Data” in “Device Maintenance Info”

NOTE

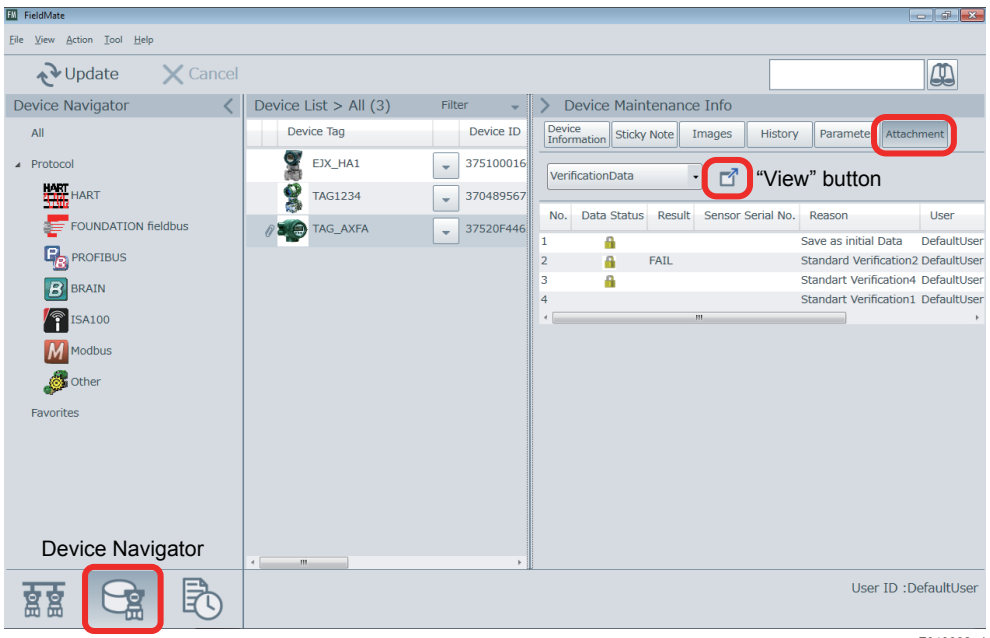
When Verification Tool is started from “Device Maintenance Info”, it will be in “offline” mode even if the AXF is in “online” mode in FieldMate.

- ## By selecting “View” button

Right-click on the target (AXF) icon displayed at “Device Navigator”, and select “Open Device Maintenance Info”.
Select “Attachment” – “View” button in “Device Maintenance Info”. Verification Tool is started up and the selected verification data is loaded.



F040301.ai



F040302.ai

Figure 4.3.1 Start-up from “Device Navigator” by Selecting the “View” Button

5 LAUNCHING

When Verification Tool is launched, **Figure 5.1.1** is displayed automatically.

Figure 5.1.1 Splash Screen

Select the verification data to be used for the verification:

1. Creating new verification data: see Section 5.1.
2. Loading existing verification data: see Section 5.2.
3. After unexpected termination: see Section 5.3

5.1 Creating New Verification Data

1) After the "Splash Screen",

1)-1 When there is no existing verification data in the database:

The splash screen is closed automatically, and then **Figure 5.1.3** is displayed.

1)-2 When there is existing verification data in the database:

1)-2-1 The splash screen is closed automatically, and then **Figure 5.1.2** is displayed.

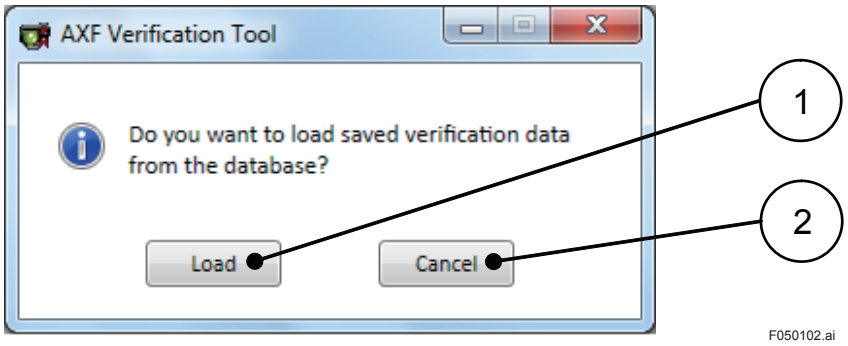


Figure 5.1.2 "Confirmation" Dialog

Table 5.1.1 "Confirmation" Dialog

Item No.	Item Name	Description
1	Load	Loads the verification data from the database. See 5.2. To load the verification data, click "Load".
2	Cancel	Creates new verification data and shows **Figure 5.1.3**. To create new verification data, click "Cancel".

1)-2-2 Click "Cancel (2)".

If "Load (1)" is selected by accident, **Figure 5.2.1** is displayed. Click "Cancel (3)" in **Figure 5.2.1**.

2) "General Information" is displayed. See **Figure 5.1.3**.
Enter each field and click "Next (8)". **Figure 6.1.1** is displayed automatically.

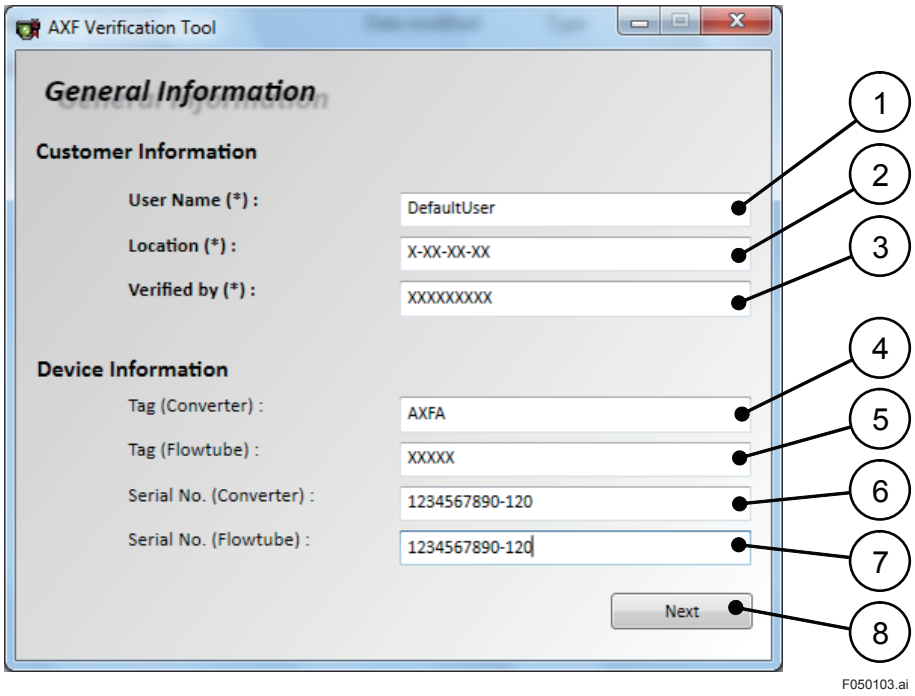


Figure 5.1.3 "General Information" Dialog

Table 5.1.2 "General Information" Dialog

Item No.	Item Name	Description
1	User Name (*)	Enter the user name. The user name of FieldMate is displayed by default. This field can be edited.
2	Location. (*)	Enter the user location.
3	Verified by (*)	Enter the name of the person to operate the verification.
4	Tag (Converter)	Enter the tag number of the converter. The value of HART parameter "Tag" is displayed by default. This field can be edited. Even if a different value is input from the HART parameter, the HART parameter is not overwritten.
5	Tag (Flowtube)	Enter the tag number of the flowtube.
6	Serial No. (Converter)	Enter the serial number of the converter.
7	Serial No. (Flowtube)	Enter the serial number of the flowtube.
8	Next	Moves to "Main Screen". See Chapter 6. Is enabled only after the mandatory fields have been filled in. Click "Next" to move to "Main Screen".

*: Mandatory field

5.2 Loading Existing Verification Data

NOTE

In terms of keeping the integrity of the data, loaded verification data cannot be copied, nor can it be saved under a different name. Loaded verification data can only be overwritten by new saved data, except for “Locked data” which cannot be modified.

1) After the “Splash screen” is closed automatically, **Figure 5.1.2** is displayed.
2) Click “Load (1)” in **Figure 5.1.2. Figure 5.2.1** is displayed.
3) Select the preferred data from “Data list (1)” and click “OK (2)” in **Figure 5.2.1**.

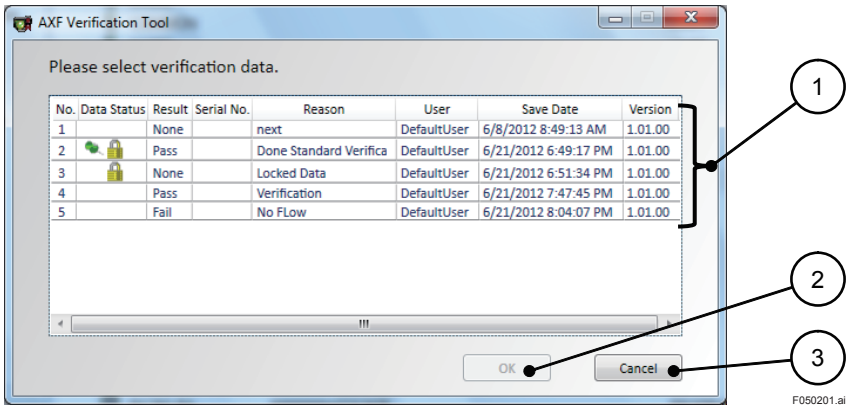

AXF Verification Tool
Please select verification data.
No. Data Status Result Serial No. Reason User Save Date Version
1 None next DefaultUser 6/8/2012 8:49:13 AM 1.01.00
2 Pass Done Standard Verifica DefaultUser 6/21/2012 6:49:17 PM 1.01.00
3 None Locked Data DefaultUser 6/21/2012 6:51:34 PM 1.01.00
4 Pass Verification DefaultUser 6/21/2012 7:47:45 PM 1.01.00
5 Fail No FLow DefaultUser 6/21/2012 8:04:07 PM 1.01.00
OK
Cancel
1
2
3
F050201.ai

Figure 5.2.1 “Select Verification Data” Dialog

Table 5.2.1 “Select Verification Data” Dialog

Item No.	Item Name	Description
1	Data list	Shows the verification data in the database. For the meaning of the icon in the “Data Status”, see Chapter 7.
2	OK	Loads the verification data. To use the verification data in the database, select the preferred one among “Data list” and click “OK”. **Figure 5.2.2** is displayed.
3	Cancel	Creates new verification data and shows **Figure 5.1.3**. See Section 5.1. To create the new verification data, click “Cancel”.

2) After loading, **Figure 5.2.2** is displayed automatically. Click “OK”. “Main Screen” is displayed. See Chapter 6.

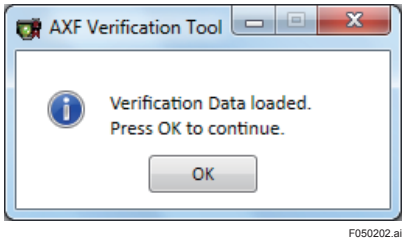


Figure 5.2.2 “Verification Data Loaded” Dialog

5.3 After Unexpected Termination

In case of launching after an unexpected termination of the program, see Section 8.2.

6 OPERATION

This chapter describes how to use Verification Tool.

For details of the verification procedure, see Section 6.2 and Section 6.3.

NOTE

- Be sure to run Standard VF.
- “Overall Status” in “Result” is carried out only when “Standard VF” is complete. When “Standard VF” is not complete, “Overall Status” is left blank.
- “Result sheet” can be printed even when “Standard VF” is not complete.

6.1 Main Screen

This screen performs the following actions:

- Loads the verification data. See Subsection 6.1.1.
- Saves the verification data. See Subsection 6.1.2.
- Prints the result sheet. See Subsection 6.1.3.
- Displays the “Standard” VF screen. See Section 6.2.
- Displays the“Enhanced” VF screen. See Section 6.3.
- Displays the “Result” screen. See Section 6.4.

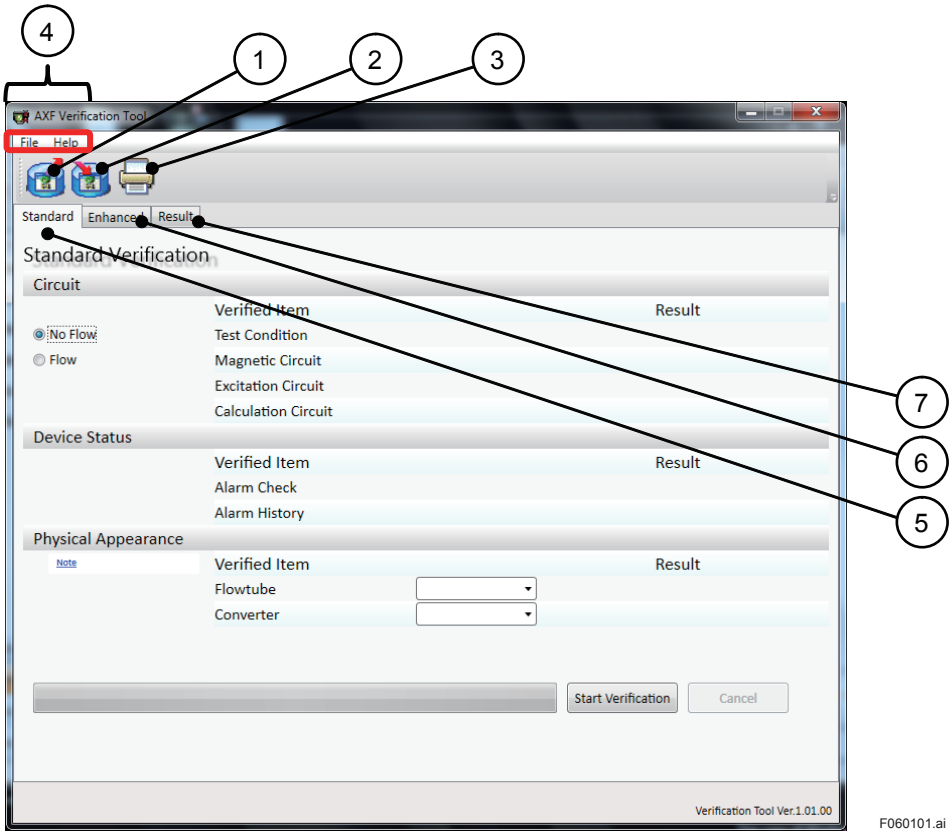


Figure 6.1.1 Main Screen

Table 6.1.1 Main Screen

Item No.	Item Name	Description
1	Load	Loads the verification data from the database. See Subsection 6.1.1. To load the verification data, click “Load”.
2	Save	Saves the current data to the database. See Subsection 6.1.2. To save the current data, click “Save”.
3	Print	Prints out the result. See Subsection 6.1.3. To print the verification result, click “Print”.
4	Menu bar	Shows the “File” and “Help” menus. See Subsection 6.1.4.
5	Standard	Selects Standard VF mode. See Section 6.2.
6	Enhanced	Selects Enhanced VF mode. See Section 6.3.
7	Result	Displays the result sheet image. See Section 6.4.

6.1.1 Load

1) Click the “Load” icon.

Figure 6.1.2 “Load” Icon

2) After clicking the “Load” icon, **Figure 6.1.3** is displayed. Select the preferred data from “Data list (1)”, then click “OK (2)”.

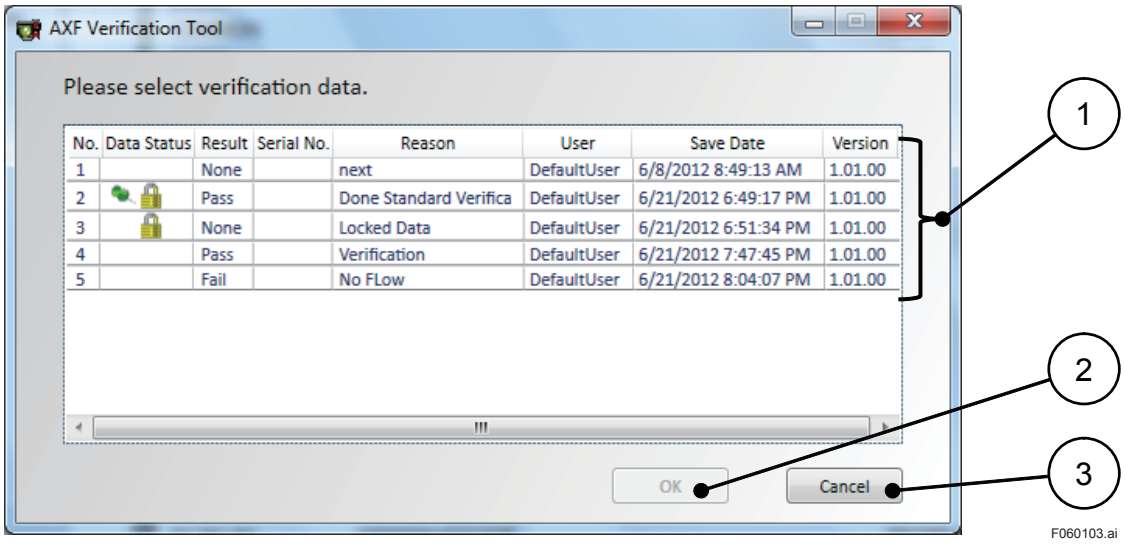

AXF Verification Tool
Please select verification data.
No. Data Status Result Serial No. Reason User Save Date Version
1 None next DefaultUser 6/8/2012 8:49:13 AM 1.01.00
2 Pass Done Standard Verifica DefaultUser 6/21/2012 6:49:17 PM 1.01.00
3 None Locked Data DefaultUser 6/21/2012 6:51:34 PM 1.01.00
4 Pass Verification DefaultUser 6/21/2012 7:47:45 PM 1.01.00
5 Fail No FLow DefaultUser 6/21/2012 8:04:07 PM 1.01.00
OK
Cancel
1
2
3
F060103.ai

Figure 6.1.3 “Select Verification Data” Dialog

Table 6.1.2 “Select Verification Data” Dialog

Item No.	Item Name	Description
1	Data list	Shows the verification data in the database. Select the preferred data.
2	OK	Performs data loading. To load the verification data from the database, click “OK”.
3	Cancel	Cancels loading the verification data and returns to “Main Screen”. See Section 6.1.

4) After loading, **Figure 6.1.4** is displayed automatically. Click “OK”.

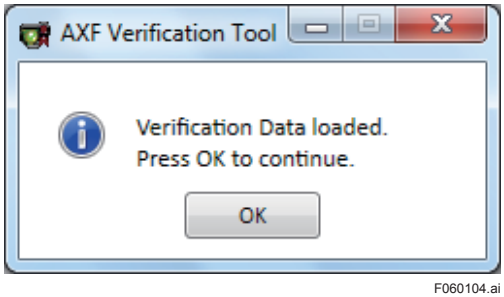


Figure 6.1.4 “Verification Data Loaded” Dialog

6.1.2 Save

By clicking the “Save” icon, the verification data is saved to the database.

After clicking “Save”, the screen changes as follows:

- When “No Flow + Flow (*1)” is not complete, see (A).
- When “No Flow + Flow” is complete, see (B).

*1: “No Flow + Flow”;
“Circuit” check and “Device Status” check for both “No Flow” and “Flow” conditions. Refer to Subsection 6.2.1.

Figure 6.1.5 “Save” Icon

(A) When “No Flow + Flow” is not complete:

1) After clicking the “Save” icon, **Figure 6.1.6** is displayed.

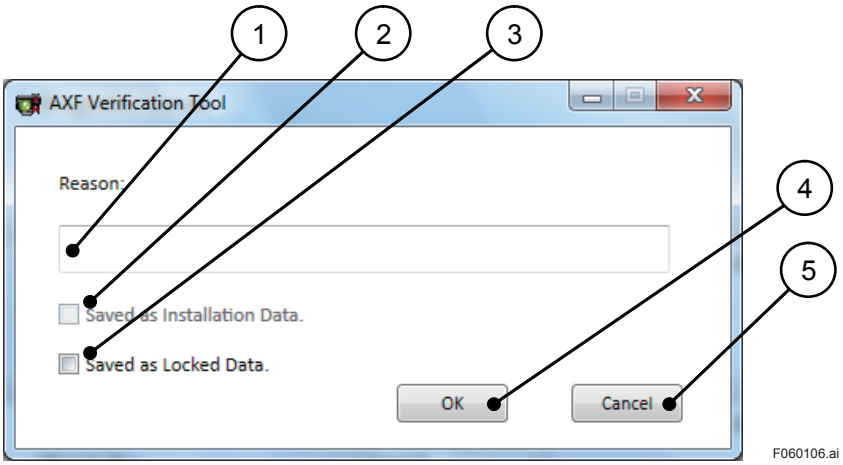


Figure 6.1.6 “Saving Data When “No Flow + Flow” Uncompleted” Dialog

Table 6.1.3 “Saving Data When “No Flow + Flow” Uncompleted” Dialog

Item No.	Item Name	Description
1	Reason	Shows the reason or comment. It can be used as a marker when loading verification data is selected. Refer to **Figure 6.1.3**. Enter preferred text. (Optional field)
2	Saved as Installation Data.	Saves the data as “Installation Data”. See Section 7.1. This field is disabled until “No Flow + Flow” is complete.
3	Saved as Locked Data.	Saves the data as “Locked Data”. See Section 7.2. To save the data as read-only, check the box. (Always valid)
4	OK	Saves the data.
5	Cancel	Cancels saving the data and returns to “Main Screen”. See Section 6.1.

2) Save the data as “Read-only” or “Editable”.

2)-1 To save the verification data as read-only:
Click “OK” after checking the “Saved as Locked Data” box in **Figure 6.1.6**.
Figure 6.1.7 is displayed. Click “Yes” in **Figure 6.1.7**.

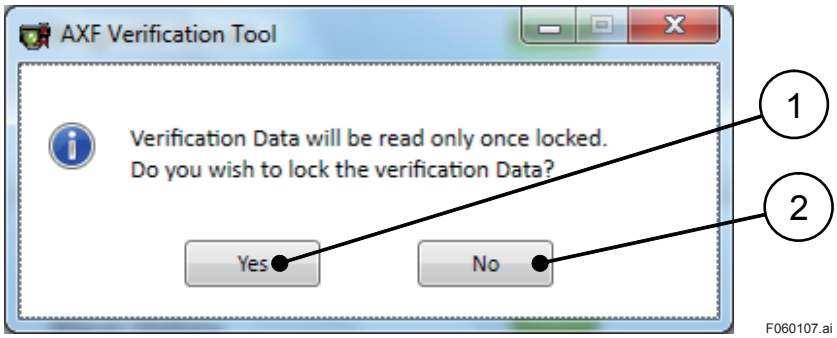


Figure 6.1.7 “Confirm Locked Data” Dialog

Table 6.1.4 “Confirm Locked Data” Dialog

Item No.	Item Name	Description
1	Yes	Saves verification data to the database as read-only.
2	No	Cancels saving the data and returns to **Figure 6.1.6**.

2)-2 To save the verification data as editable:
Click “OK” without checking the “Saved as Locked Data” box in **Figure 6.1.6**.
No dialogs appear.

3) **Figure 6.1.8** is displayed automatically. Click “OK”.

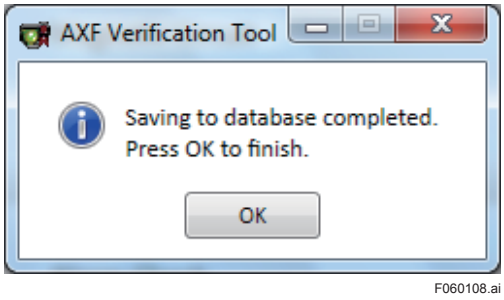


Figure 6.1.8 “Saving Completed” Dialog

(B) When “No Flow + Flow” is complete:

1) After clicking the “Save” icon, **Figure 6.1.9** is displayed.

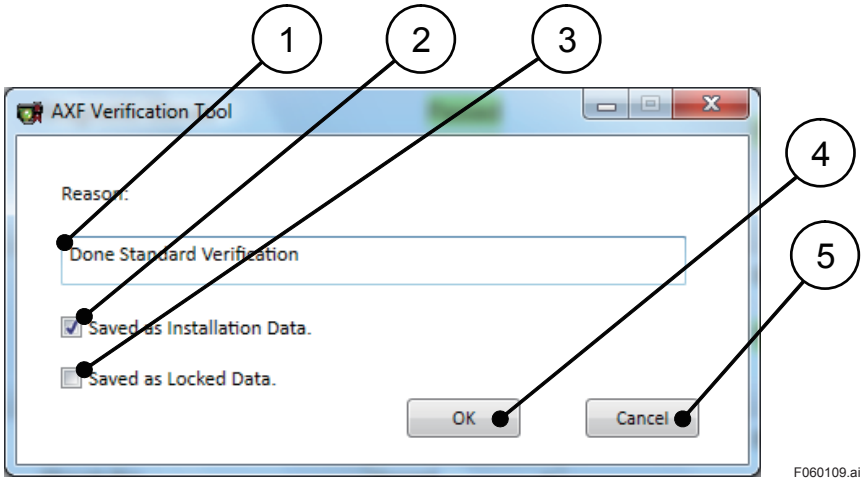


Figure 6.1.9 “Saving Data When “No Flow + Flow” Completed” Dialog

Table 6.1.5 “Saving Data When “No Flow + Flow” Completed” Dialog

Item No.	Item Name	Description
1	Reason	Shows the reason or comment. It can be used as a marker when the loading verification data is selected. Refer to **Figure 6.1.3**. Enter preferred text. (Optional field)
2	Saved as Installation Data. (*1)	Saves the data as installation data. See Section 7.1. To save the data as installation data, check the box.
3	Saved as Locked Data. (*1)	Saves the data as locked data. See Section 7.2. To save the data as locked data, check the box.
4	OK	Saves the data.
5	Cancel	Cancels saving the data and shows “Main Screen”. See Section 6.1.

*1: These items can be selected at the same time.

2) Select the preferred one accordingly.

2)-1 To save the verification data as “Installation Data”:
Click “OK” after checking the “Saved as Installation Data” box.
If there is no existing installation data in the database, no dialogs appear.
If there is existing installation data in the database, **Figure 6.1.10** is displayed.
Click “Yes” in **Figure 6.1.10**.

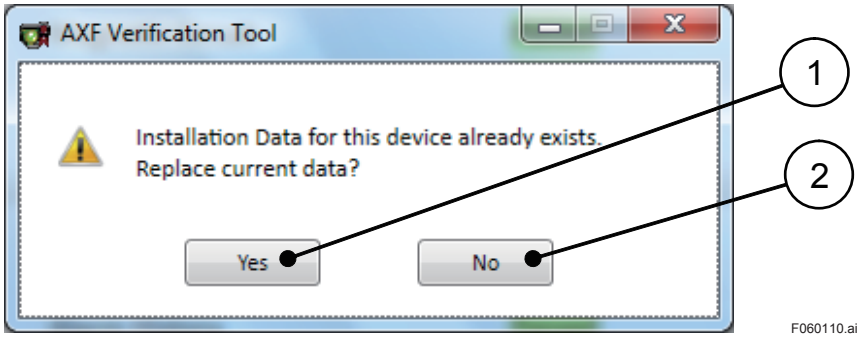


Figure 6.1.10 “Confirm Replacing Data” Dialog

Table 6.1.6 “Confirm Replacing Data” Dialog

Item No.	Item Name	Description
1	Yes	Replace the data.
2	No	Cancels replacing the data and returns to **Figure 6.1.9**.

2)-2 To save the verification data as read-only:
Click “OK” after checking the “Saved as Locked Data” box in **Figure 6.1.9**. **Figure 6.1.11** is displayed.
Click “Yes” in **Figure 6.1.11**.

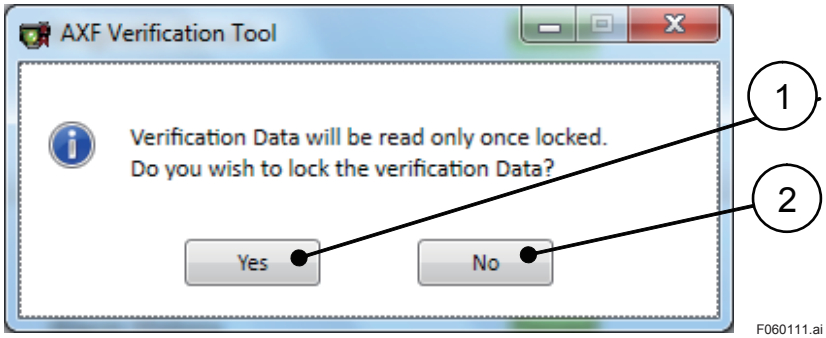


Figure 6.1.11 “Confirm Locked Data” Dialog

Table 6.1.7 “Confirm Locked Data” Dialog

Item No.	Item Name	Description
1	Yes	Saves the data as locked data.
2	No	Cancels saving the data and returns to **Figure 6.1.9**.

2)-3 To save the verification data as editable and non-installation data:
Click “OK” without checking any boxes in **Figure 6.1.9**.
No dialogs appear.

3) **Figure 6.1.12** is displayed automatically. Click “OK”.

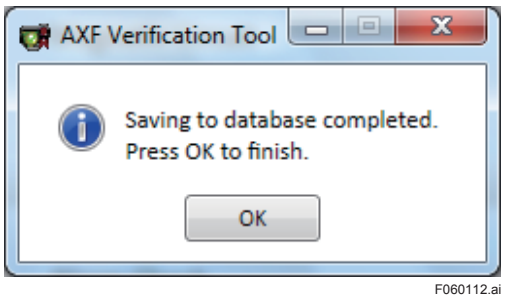
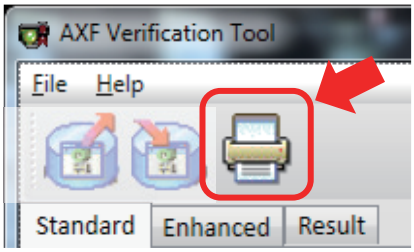


Figure 6.1.12 “Saving Completed” Dialog

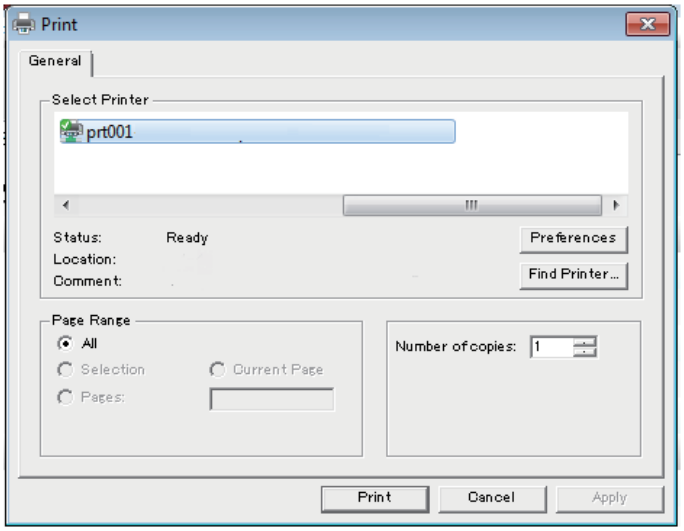
6.1.3 Print out

To print the result sheet, click the “Print” icon. **Figure 6.1.14** is displayed.



F060113.ai

Figure 6.1.13 “Print” Icon



F060114.ai

Figure 6.1.14 Example of “Print” Dialog

The printed image is the same as the “Result” tab in “Main Screen”. See Section 6.4.

The recommended paper size is A4 or letter size.

- If the paper size is smaller than the recommended one, the printed size is reduced to fit the paper.
- If the paper size is bigger than the recommended one, the printed size will be the recommended one.

6.1.4 Menu bar

There are “File” and “Help” in the menu bar.

(A) File

Select the preferred menu.

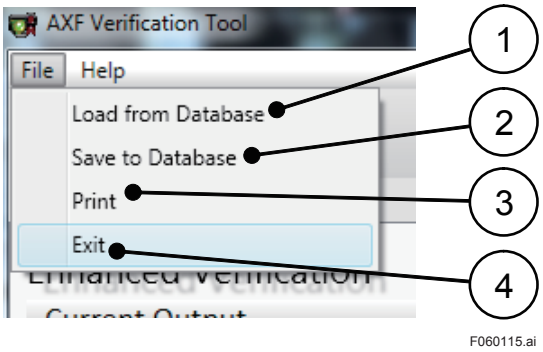


Figure 6.1.15 Menu bar

Table 6.1.8 Menu bar

Item No.	Item Name	Description
1	Load from Database	Same as “Load” in **Table 6.1.1**. See Subsection 6.1.1.
2	Save to Database	Same as “Save” in **Table 6.1.1**. See Subsection 6.1.2.
3	Print	Same as “Print” in **Table 6.1.1**. See Subsection 6.1.3.
4	Exit	Terminates the Verification Tool. See Section 8.1.

(B) Help

Upon selecting “About AXF Verification Tool…” in the “Help” menu, **Figure 6.1.17** is displayed.

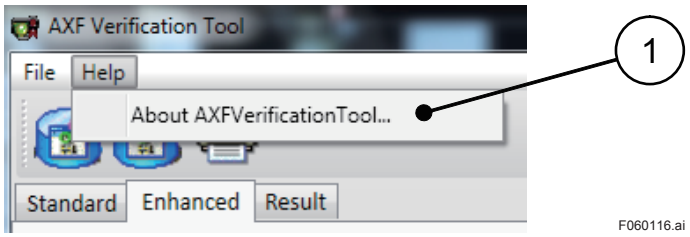


Figure 6.1.16 Help Menu

Table 6.1.9 Help Menu

Item No.	Item Name	Description
1	About AXF Verification Tool…	Shows the version of Verification Tool. See **Figure 6.1.17**.

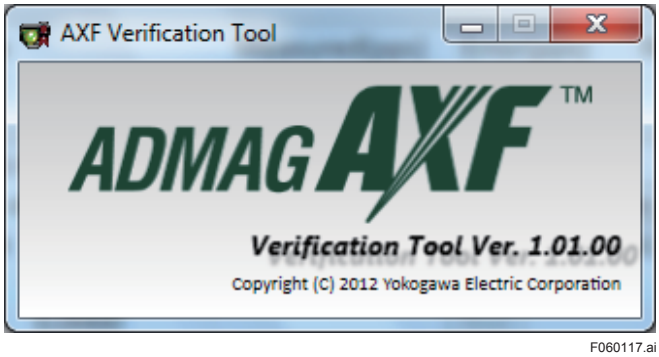


Figure 6.1.17 Example of Version Information

6.2 Standard VF

- This mode verifies the condition of the AXF without difficulty, by checking its internal parameters. No external instruments are requied.
- This mode is mandatory.
- “Circuit” check and “Device Status” check are run only when Verification Tool is in “online” mode.
- Each item can be run separately.

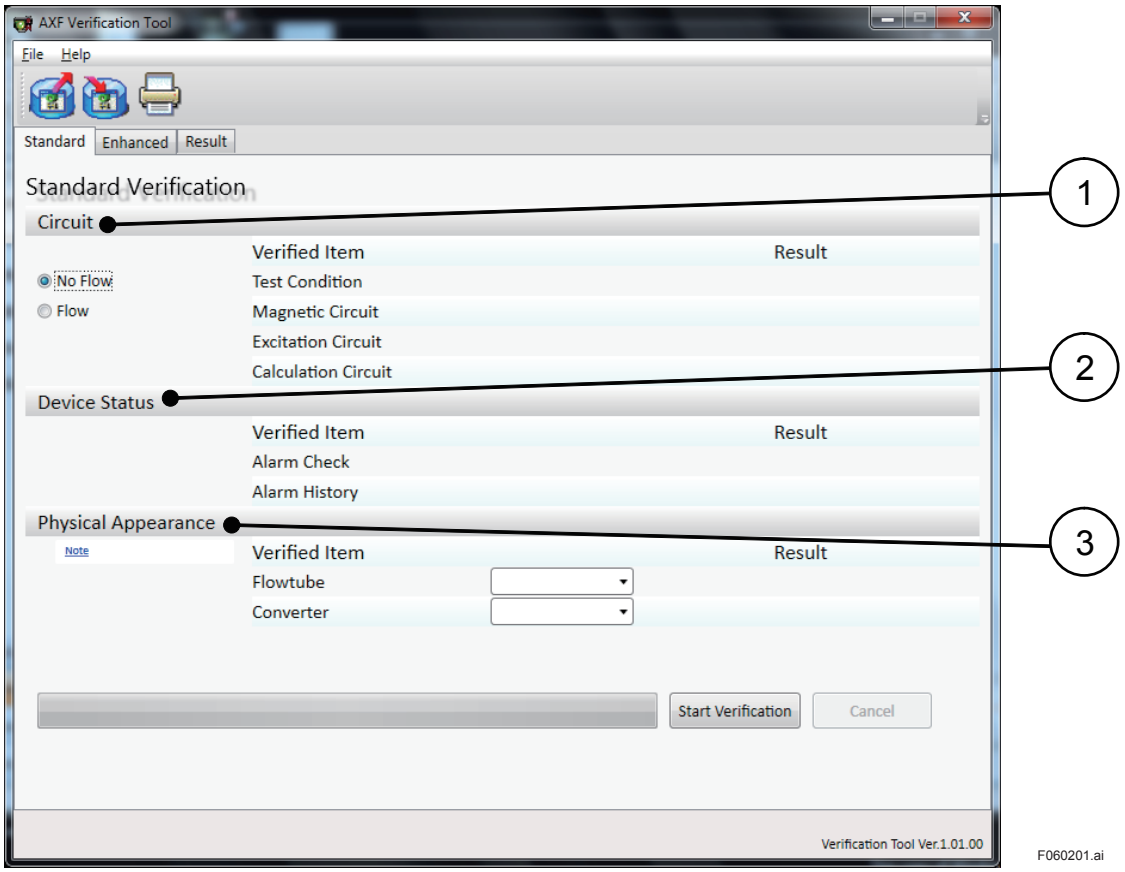


Figure 6.2.1 “Standard VF” Screen

Table 6.2.1 “Standard VF” Screen

Item No.	Item Name	Description
1	Circuit	Checks the status of device circuits. See Subsection 6.2.1.
2	Device Status	Checks the alarm in AXF parameters. See Subsection 6.2.1.
3	Physical Appearance	Checks the physical appearance. See Subsection 6.2.2.

6.2.1 “Circuit” check and “Device Status” check (Verification Tool is in “online” mode)

IMPORTANT

Make sure to keep the AXF’s power on at least for 10 minutes after you finish the Verification Tool.

If you turn the power off immediately, some of the parameters may be changed to different values from original settimg.

CAUTION

- “Circuit” check and “Device Status” check temporarily change the parameters of AXF. In case of unexpected termination, follow Section 8.2.
- The AXF flowtube should be completely filled with fluid, otherwise the results may be inadequate.

- These items are run only when Verification Tool is in “online” mode.
- These items are verified for 2 types. Each condition check can be run separately.

(A) “No Flow” condition:

Verifies the condition of the AXF by checking;

- Circuits including the excitation circuit and the magnetic circuit inside the flowtube when the fluid velocity is completely zero.
- The present and past history of alarms.

(B) “Flow” condition:

Verifies the condition of the AXF by checking;

- Circuits including the excitation circuit and the operation circuit which calculates the flow velocity when the fluid velocity is sufficient.
- The present and past history of alarms.

- There are 3 combinations:

(1) No Flow

(2) Flow

(3) Flow + No Flow

- The check items of the “Circuit” check depend on the case as follows:
  - Nominal size of the unit.
  - With or without the optional code ELC (DC Noise Cut Circuit).
  - Test condition type; “Flow” or “No Flow”.

For details, see **Table 6.2.2**.

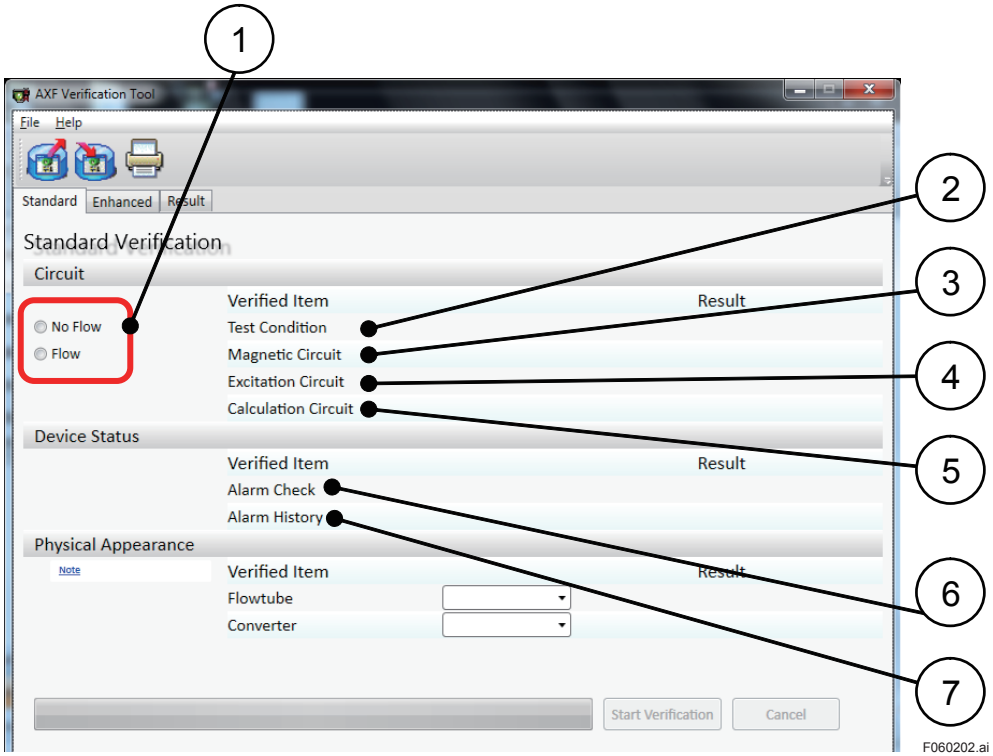


Figure 6.2.2 "Circuit and Device Status" Screen

Table 6.2.2 "Circuit and Device Status" Screen

(1) Nominal size is 400mm or smaller, without optional code ELC

Item No.	Item Name		Description	Check is [possible/ not available]		
				No Flow	Flow	No Flow + Flow
1	No Flow Flow		Shows test condition. Select the test condition			
2	Test Condition		Shows operated test condition. "No Flow" or " Flow" or " No Flow + Flow" See Figure 6.2.13.			
3	Circuit	Magnetic Circuit	Shows the result of the Magnetic Circuit check. "Magnetic Circuit" means checking the magnetic circuit inside the flowtube.	**Possible**	Not Available [Shows: N/A]	**Possible**
4		Excitation Circuit	Shows the result of the Excitation Circuit check. "Excitation Circuit" means checking the excitation circuit by the excitation current measurement.	**Possible**	**Possible**	**Possible**
5		Calculation Circuit	Shows the result of the Calculation Circuit check. "Calculation Circuit" means checking the operation circuit which calculates the flow velocity.	Not Available [Shows :N/A]	**Possible**	**Possible**
6	Device Status	Alarm Check	Shows the result of the Alarm Check. "Alarm Check" means checking the occurrence of alarms.	**Possible**	**Possible**	**Possible**
7		Alarm History	Shows the result of Alarm History Check. "Alarm History Check" means checking the history of alarms that occurred.	**Possible**	**Possible**	**Possible**

(2) Nominal size is over 400mm, without optional code ELC (DC Noise Cut Circuit)

Item No.	Item Name		Description	Check is [possible/ not available]		
				No Flow	Flow	No Flow + Flow
1	No Flow Flow		Same as Table 6.2.2 (1) “No.1”			
2	Test Condition		Same as Table 6.2.2 (1) “No.2”			
3	Circuit	Magnetic Circuit	Same as Table 6.2.2 (1) “No.3”	**Possible**	Not Available [Shows :N/A]	**Possible**
4		Excitation Circuit	Same as Table 6.2.2 (1) “No.4”	**Possible**	**Possible**	**Possible**
5		Calculation Circuit	Same as Table 6.2.2 (1) “No.5”	Not Available [Shows :N/A]	Not Available [Shows :N/A]	Not Available [Shows :N/A]
6	Device Status	Alarm Check	Same as Table 6.2.2 (1) “No.6”	**Possible**	**Possible**	**Possible**
7		Alarm History	Same as Table 6.2.2 (1) “No.7”	**Possible**	**Possible**	**Possible**

(3) With optional code ELC (DC Noise Cut Circuit)

Item No.	Item Name		Description	Check is [possible/ not available]		
				No Flow	Flow	No Flow + Flow
1	No Flow Flow		Same as Table 6.2.2 (1) “No.1”			
2	Test Condition		Same as Table 6.2.2 (1) “No.2”			
3	Circuit	Magnetic Circuit	Same as Table 6.2.2 (1) “No.3”	Not Available [Shows :N/A]	Not Available [Shows :N/A]	Not Available [Shows :N/A]
4		Excitation Circuit	Same as Table 6.2.2 (1) “No.4”	**Possible**	**Possible**	**Possible**
5		Calculation Circuit	Same as Table 6.2.2 (1) “No.5”	Not Available [Shows :N/A]	Not Available [Shows :N/A]	Not Available [Shows :N/A]
6	Device Status	Alarm Check	Same as Table 6.2.2 (1) “No.6”	**Possible**	**Possible**	**Possible**
7		Alarm History	Same as Table 6.2.2 (1) “No.7”	**Possible**	**Possible**	**Possible**

(A) No Flow (The fluid velocity is completely zero)

1) Fill the flowtube with fluid completely. Be sure that the fluid velocity is completely zero.

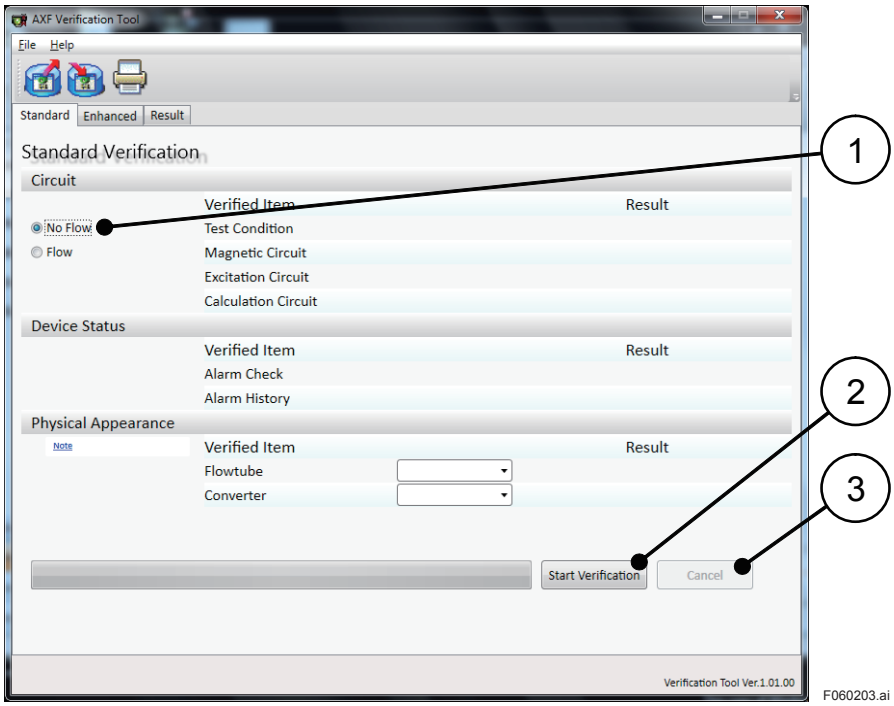


Figure 6.2.3 “Flow/ No Flow” Screen

Table 6.2.3 “Flow/ No Flow” Screen

Item No.	Item Name	Description
1	No Flow	Selects the “No Flow” test condition.
2	Start Verification (*1)	Runs “Circuit” check and “Device Status” check. These checks are performed automatically. The Progress Bar is displayed at the bottom left.
3	Cancel	Stops running “Circuit” check and “Device Status” check.

*1: When the AXF protect function is set to “Protect”, **Figure 3.2.2** is displayed. Follow Subsection 3.2.2.

2) Select “No Flow (1)” and click “Start Verification (2)”.

3) Before running “Circuit” check and “Device Status” check, **Figure 6.2.4** is displayed.

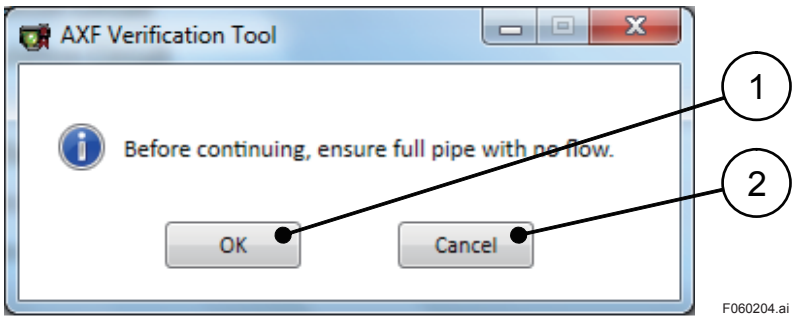


Figure 6.2.4 “No Flow Confirmation” Dialog

Table 6.2.4 “No Flow Confirmation” Dialog

Item No.	Item Name	Description
1	OK	Runs “Circuit” check and “Device Status” check.
2	Cancel	Stops running “Circuit” check and “Device Status” check, and displays “Main Screen”.

4) Click “OK (1)“ after confirming that the flowtube is filled with fluid and the fluid velocity is completely zero. “Circuit” check and “Device Status” check are run. During these checks, the status bar and remaining time are displayed. See **Figure 6.2.5**. Regarding the execution time, see **Table 6.2.5**.

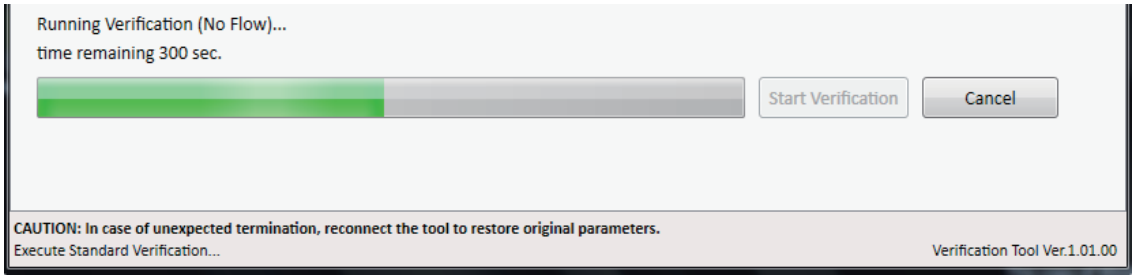
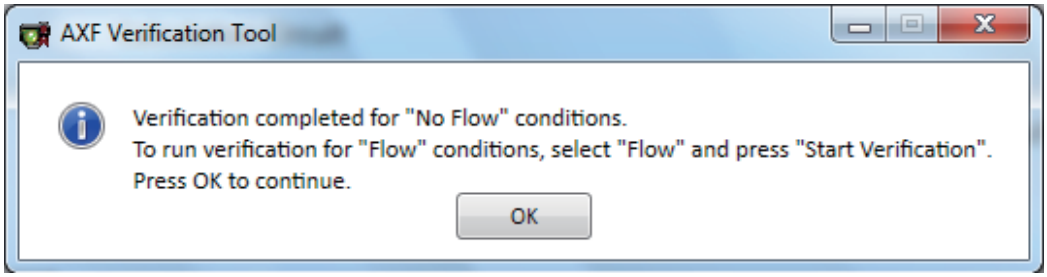


Figure 6.2.5 “During ”Circuit” Check and “Device Status” Check” Screen

Table 6.2.5 Execution Time [No Flow]

No.	Optional code	Execution time
1	Without ELC	630 s
2	With ELC (DC Noise Cut Circuit)	120 s

5) After the “Circuit” check and “Device Status” check are completed for the “No Flow” condition, **Figure 6.2.6** is displayed automatically. Click “OK”.


AXF Verification Tool
Verification completed for "No Flow" conditions.
To run verification for "Flow" conditions, select "Flow" and press "Start Verification".
Press OK to continue.
OK

F060206.ai

Figure 6.2.6 “No Flow Verification Completion” Dialog

6) “Result” is entered automatically. See **Figure 6.2.13**.

(B) Flow (The fluid velocity is sufficient)

1) Fill the flowtube with fluid. Be sure that the fluid velocity is sufficient.

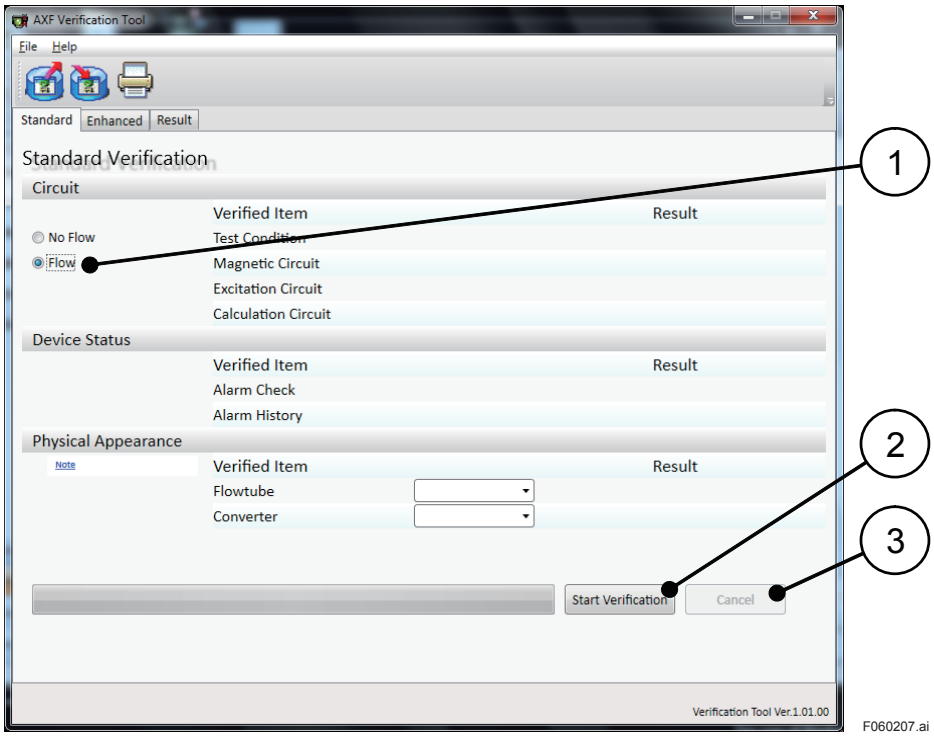


Figure 6.2.7 "Flow/ No Flow" Screen

Table 6.2.6 "Flow/ No Flow" Screen

Item No.	Item Name	Description
1	Flow	Selects the "Flow" test condition.
2	Start Verification (*1)	Runs "Circuit" check and "Device Status" check. Those checks are performed automatically. The progress bar is displayed at the bottom left.
3	Cancel	Stops running "Circuit" check and "Device Status" check.

*1: When the AXF protect function is set to "Protect", **Figure 3.2.2** is displayed. Follow Subsection 3.2.2.

2) Select "Flow (1)" and click "Start Verification (2)".

3) Before running "Circuit" check and "Device Status" check, **Figure 6.2.8** is displayed automatically.

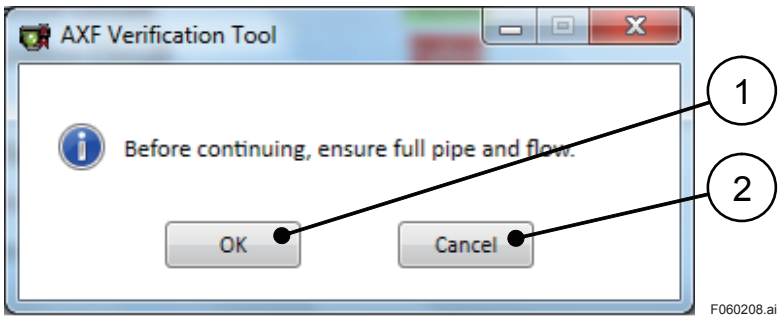


Figure 6.2.8 “Flow Confirmation” Dialog

Table 6.2.7 “Flow Confirmation” Dialog

Item No.	Item Name	Description
1	OK	Runs “Circuit” check and “Device Status” check.
2	Cancel	Stops running “Circuit” check and “Device Status” check, and displays “Main Screen”.

4) Click “OK (1)” after confirming that the flowtube is filled with fluid and the fluid velocity is sufficient. “Circuit” check and “Device Status” check are run. During these checks, the status bar and remaining time are displayed. See **Figure 6.2.9**. Regarding the execution time, see **Table 6.2.8**.

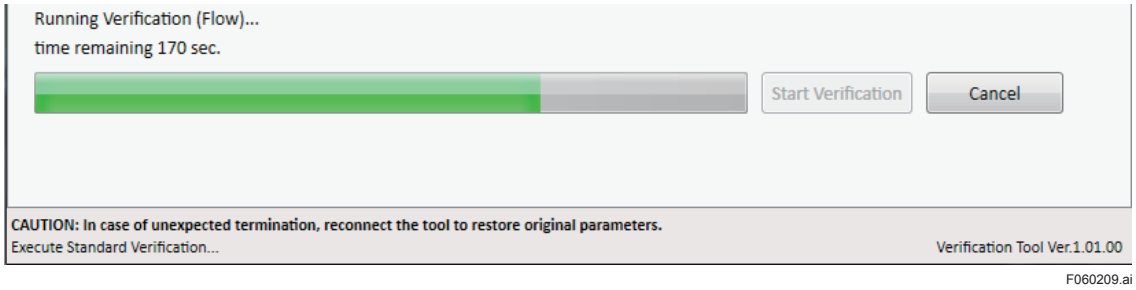


Figure 6.2.9 “During ”Circuit” Check and “Device Status” Check” Screen

Table 6.2.8 Execution time [Flow]

No.	Optional code	Execution time
1	Without ELC	630 s
2	With ELC (DC Noise Cut Circuit)	120 s

5) After the “Circuit” check and the “Device Status” check are completed for the “Flow” condition, **Figure 6.2.10** is displayed automatically. Click “OK”.

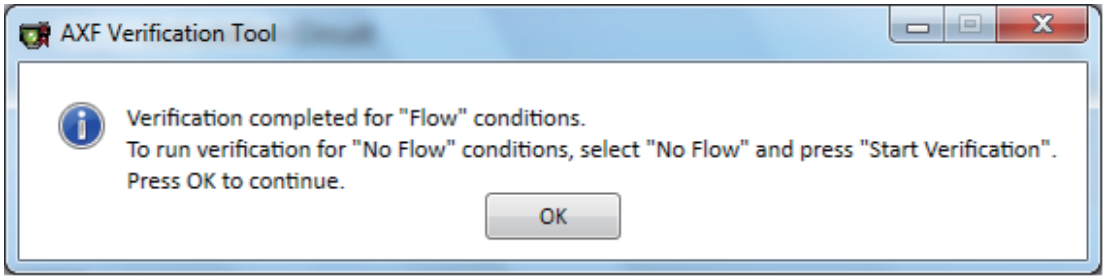

AXF Verification Tool
Verification completed for "Flow" conditions.
To run verification for "No Flow" conditions, select "No Flow" and press "Start Verification".
Press OK to continue.
OK
F060210.ai

Figure 6.2.10 “Flow Verification Completed” Dialog

6) “Result” is entered automatically. See **Figure 6.2.13**.

6.2.2 Physical Appearance

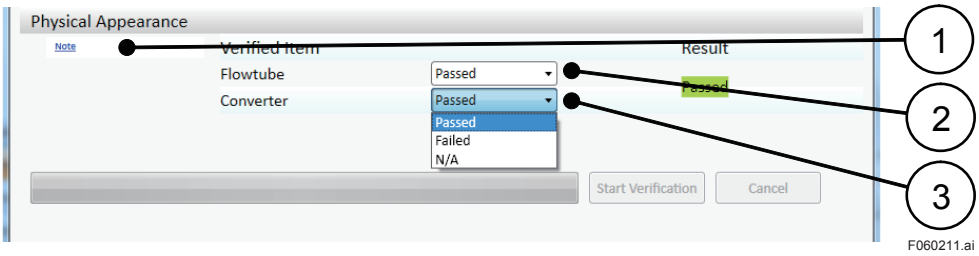


Figure 6.2.11 "Physical Appearance" Screen

Table 6.2.9 "Physical Appearance" Screen

Item No.	Item Name	Description
1	Note	Opens another window as shown in **Figure 6.2.12**. Click "Note".
2	Flowtube	Selects the result of the Flowtube Appearance Check.
3	Converter	Selects the result of the Converter Appearance Check.

Physical Appearance
A physical observation of the Flowmeter is required, check the following items:

Flowtube
Check the Flowtube and the Cables connected to the Flowtube for:
* Deformation, Damage, Corrosion, Cracking, Signs of Abrasion and any Leaks.

Converter
Check the Converter and the Cables connected to the Converter for:
* Corrosion, Damage, moisture in the housing, corroded terminals.

Observations are objective.

F060212.ai

Figure 6.2.12 Example of Physical Appearance "Note"

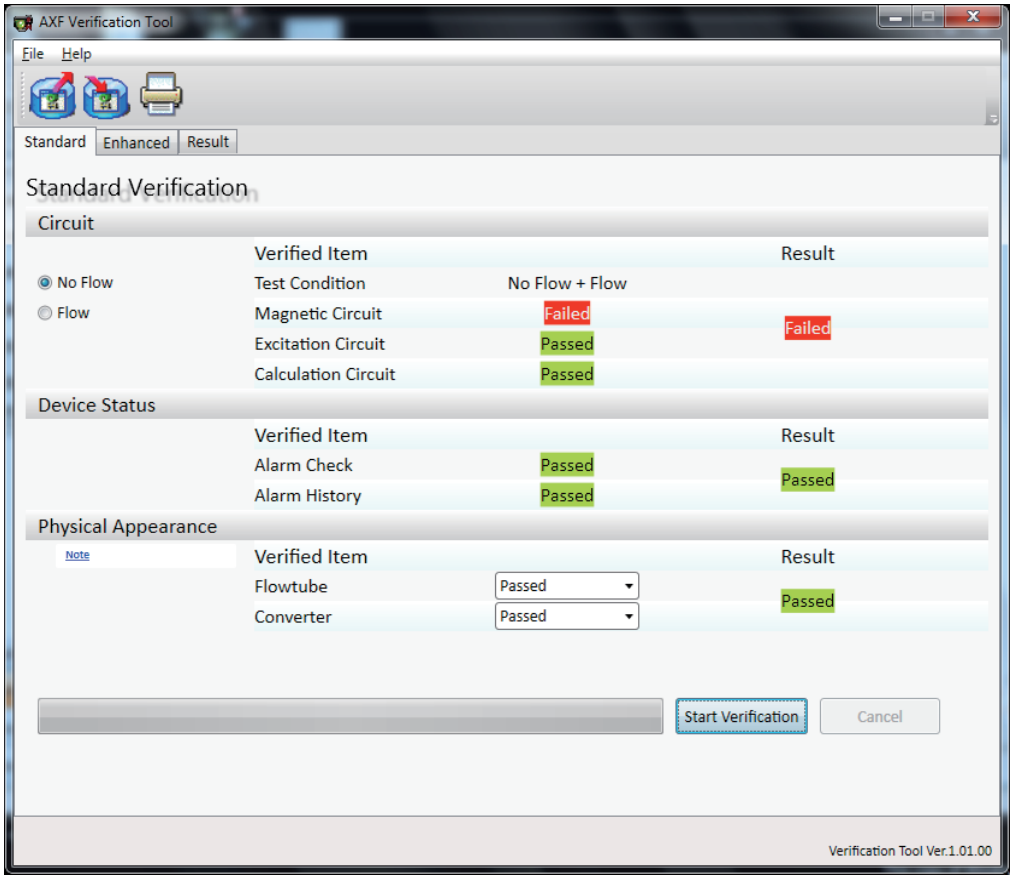
1) Check the physical appearance of "Flowtube" and "Converter".
   For details, see **Figure 6.2.12**.
2) Select an applicable result manually in **Table 6.2.10**.

Table 6.2.10 Physical Appearance

Result	Description
Passed	Is selected when the result is good and there is no problem.
Failed	Is selected when the result is bad.
N/A	Is selected when the appearance check is not possible.

3) "Total Result" is displayed automatically. See **Figure 6.2.13**.

6.2.3 Standard VF Result



F060213.ai

Figure 6.2.13 Example of "Result of Standard VF"

6.3 Enhanced VF

- This mode provides more reliable verification by performed inspections equivalent to SERVICE.
- This mode is optional.
- This mode verifies AXF by using external instruments, such as Magnetic Flowmeter Calibrator AM012, Handy Calibrator CA150, and so on.
- Even when FieldMate is in “offline” mode, this mode can be run, but some manual setting will have to be performed.

NOTE

When Verification Tool is in “online” mode:

If Verification Tool turns to “offline” mode due to wiring disconnections, reconnect FieldMate and AXF. Verification Tool will restore to “online” mode again.

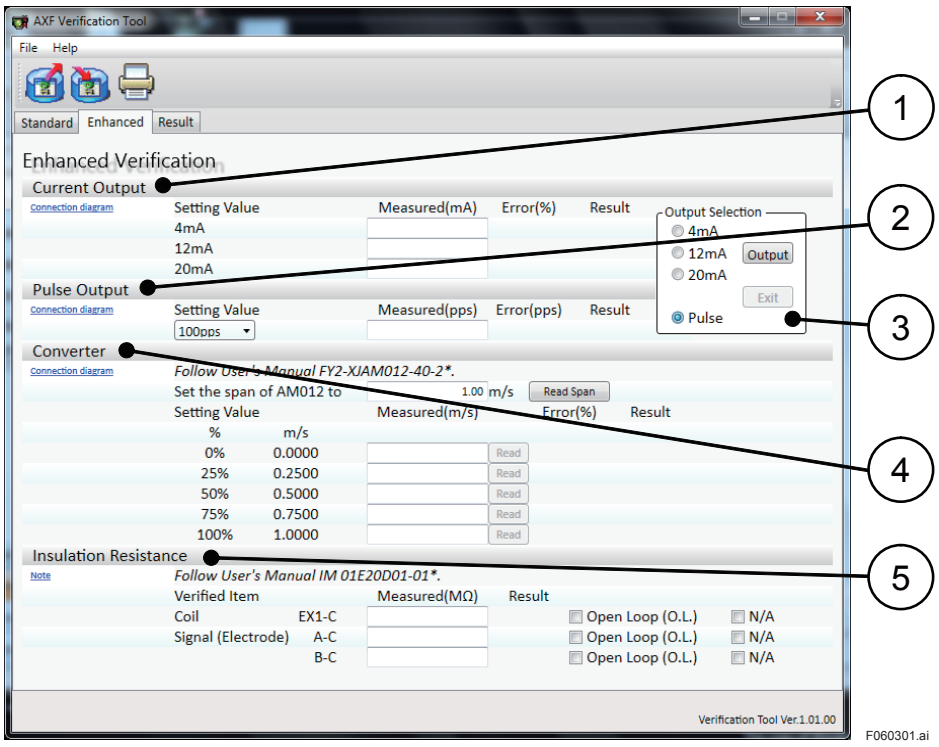


Figure 6.3.1 “Enhanced VF” Screen

Table 6.3.1 “Enhanced VF” Screen

Item No.	Item Name	Description
1	Current Output	Checks the current output. See Subsection 6.3.1.
2	Pulse Output	Checks the pulse output. See Subsection 6.3.2.
3	Output Selection	Outputs the current or pulse in accordance with the check items. See Subsection 6.3.1 or Subsection 6.3.2
4	Converter	Checks the accuracy of the converter by using AM012. See Subsection 6.3.3.
5	Insulation Resistance	Checks the insulation resistance. See Subsection 6.3.4.

6.3.1 Current Output

This item checks the current output from the converter.

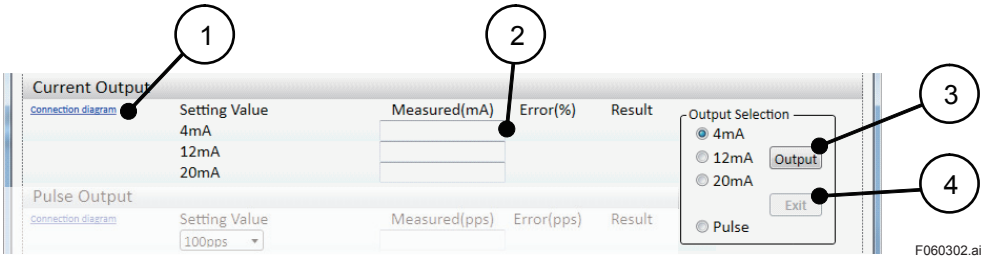


Figure 6.3.2 “Current Output” Screen

Table 6.3.2 “Current Output” Screen

Item No.	Item Name	Description
1	Connection diagram	Shows the connection diagram on another screen. See **Figure 6.3.3**.
2	Measured (mA)	Enter the measured value manually.
3	Output (*1) in Output Selection	Outputs the current. By clicking “Output” after selecting each setting value, the preferred current is transferred to AXF. (Only when Verification Tool is in “online” mode)
4	Exit in Output Selection	Stops the current output and enables other operations. (Only when Verification Tool is in “online” mode)

*1: When the AXF protect function is set to “Protect”, **Figure 3.2.2** is displayed after clicking “Output”. Follow Subsection 3.2.2.

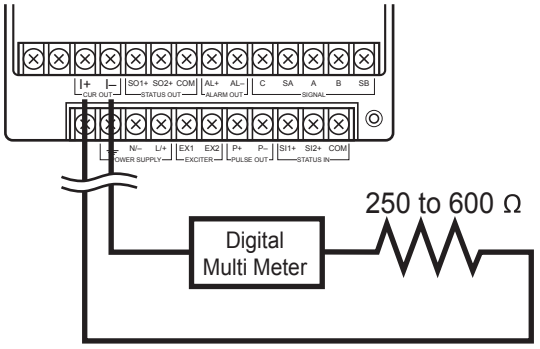
(A) AXFA11 Remote Converter

Current Output

Use a Yokogawa CA150 Handy Calibrator or similar.

NOTE

Set the Digital MultiMeter (CA150 or similar) to measure the current in “mA”.



F060303-A.ai

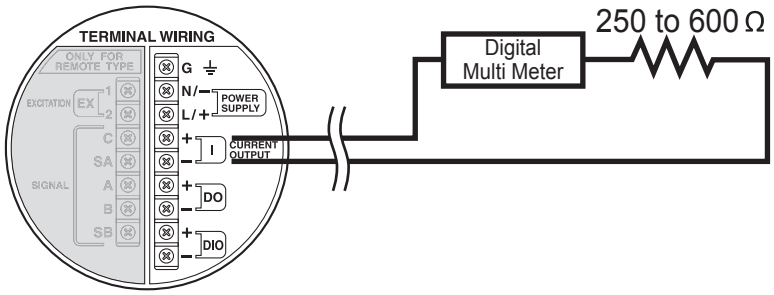
(B) AXFA14 Remote Converter or AXF Integral Flowmeter

Current Output

Use a Yokogawa CA150 Handy Calibrator or similar.

NOTE

Set the Digital MultiMeter (CA150 or similar) to measure the current in “mA”.



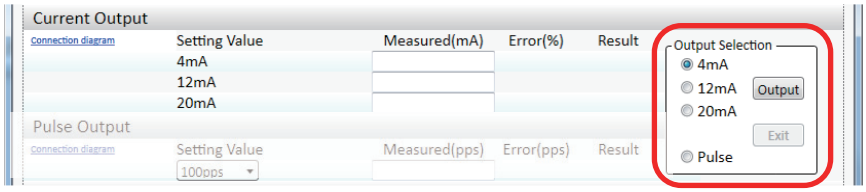
F060303-B.ai

Figure 6.3.3 Current Output Connection Diagram

1) Wire AXF and CA150 Handy Calibrator or similar as shown in **Figure 6.3.3**.

2) Set a current value to output.

2)-1 When Verification Tool is in “online” mode:
Select 4 mA, 12 mA, or 20 mA in “Output Selection” and click “Output”.



F060304.ai

Figure 6.3.4 “Output Selection” in “Current Output”

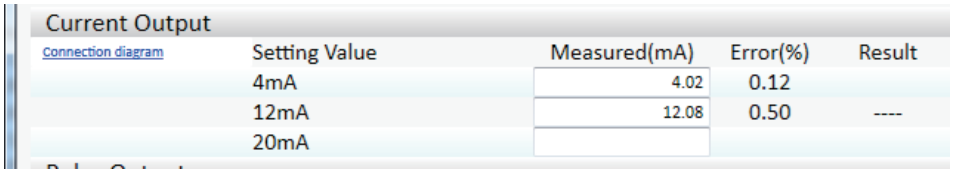
2)-2 When Verification Tool is in “offline” mode:
Set the AXF HART parameter “Loop test” to the preferred value.

Table 6.3.3 Parameter Setting of “Current Output”

HART Parameter (DD)		Parameter of AXF Display	Setting Value
Loop test	Device Setup → Diag/Service → Output Test→ Loop test	-	• 4 mA • 20 mA • Other (12 mA)

3) Measure the current output value by using CA150 Handy Calibrator or similar for each setting value.

4) Enter the measured current value in each “Mesured(mA)” manually. “Error(%)” is calculated automatically.



F060305.ai

Figure 6.3.5 “Current Output” Result

5) End processing

5)-1 When Verification Tool is in “online” mode:
Click “Exit” in “Output Selection”. “Result” is displayed automatically after filling in all fields.

5)-2 When Verification Tool is in “offline” mode:
“Result” is displayed after filling in all fields.

6.3.2 Pulse Output

This item checks the pulse output from the converter.

Check the Suffix Code of AXF converter or AXF integral flowmeter.

- Without optional code EM, see “(A) Pulse Output (without optional code EM)”.
- With optional code EM, see “(B) Active Pulse Output (with optional code EM)”.

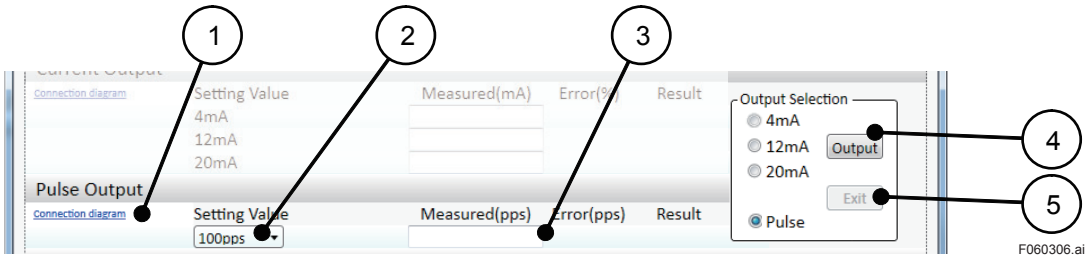


Figure 6.3.6 “Pulse Output” Screen

Table 6.3.4 “Pulse Output” Screen

Item No.	Item Name	Description
1	Connection diagram	Shows the connection diagram on another screen. The diagram is any of those in **Figure 6.3.9 or Figure 6.3.13** depending on the case.
2	Setting Value	Selects and shows the setting pulse value.
3	Measured (pps)	Shows the measured value. Enter the measured value manually.
4	Output (*1) in Output Selection	Outputs the pulse. By clicking “Output” after selecting “Pulse”, the pulse with the value of “Setting value (2)” is transferred to AXF. (Only when Verification Tool is in “online” mode)
5	Exit In Output Selection	Stops pulse output and enables other operations. (Only when Verification Tool is in “online” mode)

*1: When the AXF protect function is set to “Protect”, **Figure 3.2.2** is displayed after clicking “Output”. Follow Subsection 3.2.2.

(A) Pulse Output (without optional code EM)

1) Wire AXF and CA150 Handy Calibrator or similar as shown in **Figure 6.3.9**.

2) Select “100 pps” in “Setting Value”. See **Figure 6.3.7**.

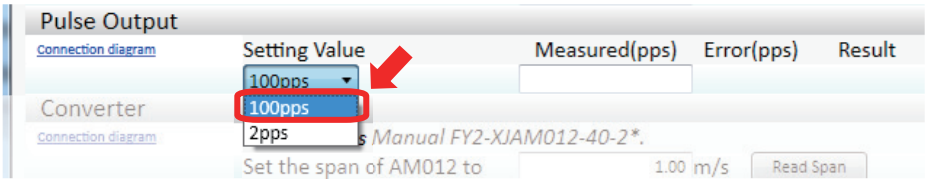


Figure 6.3.7 “Setting Value” in “Pulse Output”

3) Output

3)-1 When Verification Tool is in “online” mode:
Select “Pulse” in “Output Selection” and click “Output”. See **Figure 6.3.8**

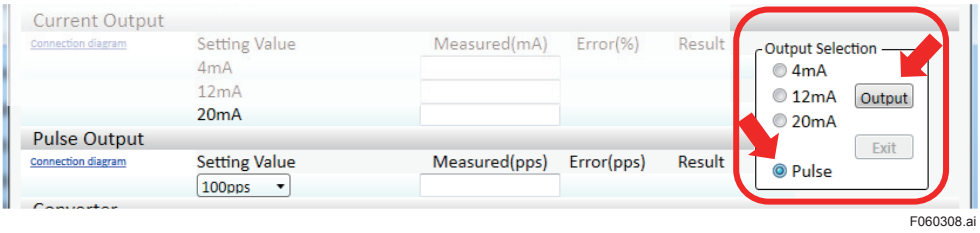


Figure 6.3.8 “Output Selection” in “Pulse Output”

3)-2 When Verification Tool is in “offline” mode:

3)-2-1 Record the original AXF parameters, and then set them as shown below.

Table 6.3.5 Parameter Settings of “Pulse Output”

HART Parameter		Parameter of AXF Display	Setting Value
Pulse Scale	Device Setup → Easy Setup → Pulse Scale	B33/E11	100
Pulse Width	Device Setup → Pulse Set → Pulse Width	E12	50% Duty
Pulse Unit	Device Setup → Easy Setup → Pulse Scale	B32/E10	Pulse/s
Test DO (*1)	Device Setup → Diag/Service → Output Test→ Test DO	N30	Pulse
DO Function(*1)	Device Setup → Configuration → Status Function → DO Function	F20	Pulse Output

*1: Only for AXFA14 or AXF Integral Flowmeter

3)-2-2 Output pulse by setting AXF HART parameter “Loop test” to “20 mA”.

Table 6.3.6 Parameter Setting of “Pulse Output”

HART Parameter (DD)		Parameter of AXF Display	Setting Value
Loop test	Device Setup → Diag/Service → Output Test→ Loop test	-	20 mA

NOTE

- Measure for more than 60 seconds.
- If using a YOKOGAWA CA150, set the mode to “Contact Input” and the range to “CPM”.

4) Measure the pulse output value in “pps” with a Yokogawa CA150 Handy Calibrator or equivalent to simplify the measurement of pulses. If such a device is unavailable, an appropriate load (30V DC, 0.2A max) is required and use the configuration shown in **Figure 6.3.9**.

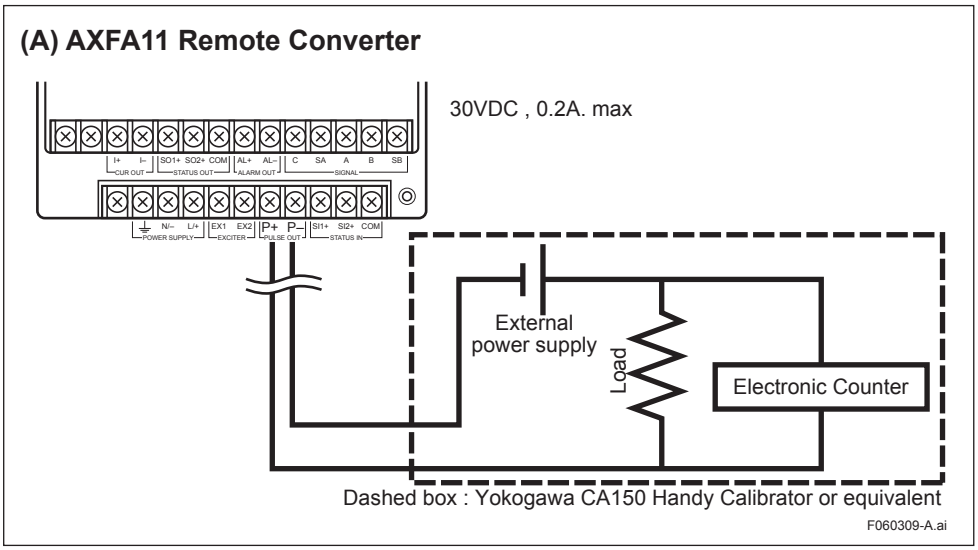


Figure 6.3.9 Pulse Output Diagram (without optional code EM)

5) Enter the measured value manually.

6) “Result” is displayed automatically.

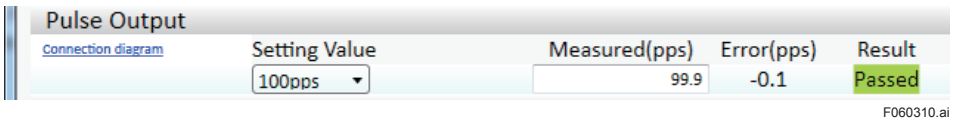


Figure 6.3.10 “Pulse Output” Result

7) End processing

7)-1 When Verification Tool is in “online” mode:
Click “Exit” in “Output Selection”.

7)-2 When Verification Tool is in “offline” mode:
Set the AXF parameters back to their original values manually.

(B) Active Pulse Output (with optional code EM)

1) Wire AXF and CA150 Handy Calibrator or similar as shown in **Figure 6.3.13**.

2) Select “2 pps” in “Setting Value”. See **Figure 6.3.11**.

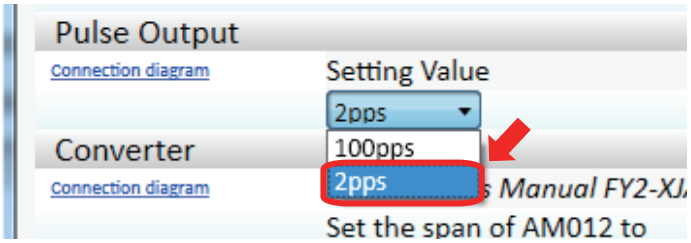


Figure 6.3.11 “Setting Value” in “Active Pulse Output”

3) Output

3)-1 When Verification Tool is in “online” mode:
Select “Pulse” in “Output Selection” and click “Output”. See **Figure 6.3.12**.

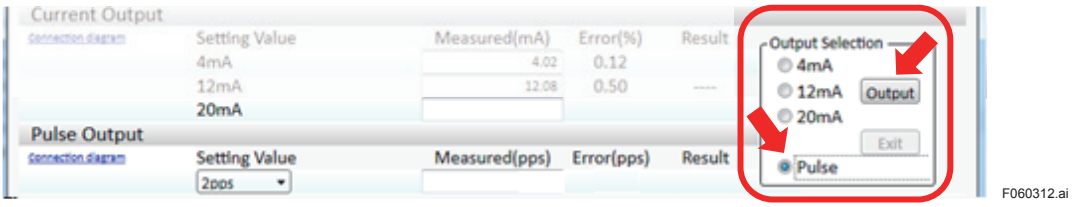


Figure 6.3.12 “Output Selection” in “Active Pulse Output”

3)-2 When Verification Tool is in “offline” mode:

3)-2-1 Record the original AXF parameters, and then set them as shown below.

Table 6.3.7 Parameter Settings of “Active Pulse Output”

HART Parameter (DD)		Parameter of AXF Display	Setting Value
Pulse Scale	Device Setup → Easy Setup → Pulse Scale	B33/E11	2
Pulse Width	Device Setup → Pulse Set → Pulse Width	E12	100ms
Pulse Unit	Device Setup → Easy Setup → Pulse Scale	B32/E10	Pulse/s
Test DO (*1)	Device Setup → Diag/Service → Output Test→ Test DO	N30	Pulse
DO Function(*1)	Device Setup → Configuration → Status Function → DO Function	F20	Pulse Output

(*1) only for AXFA14 or AXF Integral Flowmeter

3)-2-2 Output pulse by setting AXF HART parameter “Loop test” to “20 mA”.

Table 6.3.8 Parameter Setting of “Active Pulse Output”

HART Parameter (DD)		Parameter of AXF Display	Setting Value
Loop test	Device Setup → Diag/Service → Output Test→ Loop test	-	20 mA

NOTE

- Measure for more than 60 seconds.
- If using a YOKOGAWA CA150, set the mode to “Frequency (FREQ) and Pulse” and the range to “CPM”.
- An appropriate load (24 VDC ± 20%, 150 mA max) is required.

4) Measure the pulse output value in “pps” with a Yokogawa CA150 Handy Calibrator or equivalent to simplify the measurement of pulses. If such a device is unavailable, use the configuration shown in **Figure 6.3.13**.

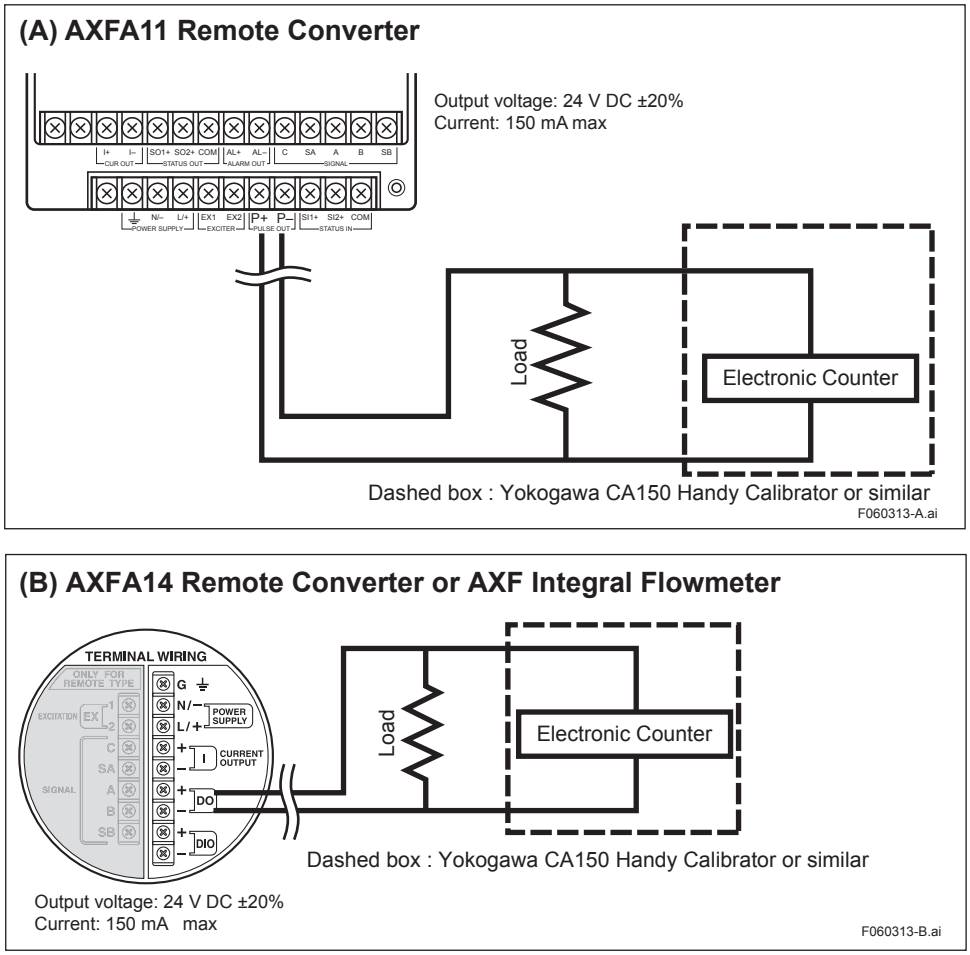


Figure 6.3.13 Active Pulse Output Diagram (with optional code EM)

5) Enter the measured value manually.

6) “Result” is displayed automatically.

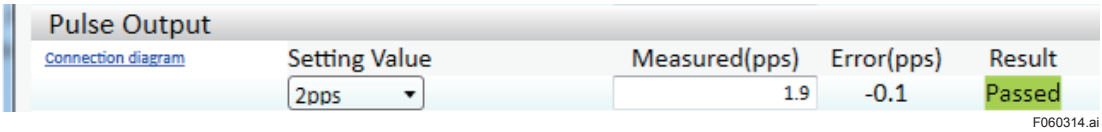


Figure 6.3.14 “Active Pulse Output” Result

7) End processing

7)-1 When Verification Tool is in “online” mode:
Click “Exit” in “Output Selection”.

7)-2 When Verification Tool is in “offline” mode:
Set the AXF parameters back to their original values manually.

6.3.3 Converter

WARNING

Follow User's Manual FY2-XJAM012-40-2E for correct operation and safe handling.

This item checks the accuracy of the AXF converter with Magnetic Flowmeter Calibrator AM012.

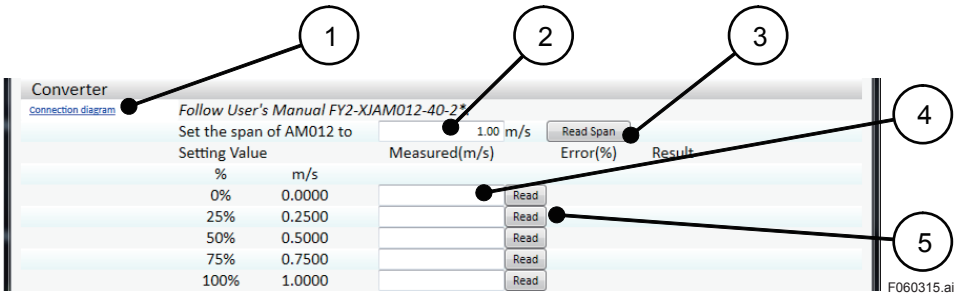


Figure 6.3.15 "Converter" Screen

Table 6.3.9 Converter

Item No.	Item Name	Description
1	Connection diagram	Shows the connection diagram on another screen. The diagram is (A) or (B) in **Figure 6.3.16** depending on the case.
2	Span	Shows the Span of the converter. This field can be edited.
3	Read Span	Reads the Span of the converter. Press "Read Span". (Only when Verification Tool is online to AXF)
4	Measured (m/s)	Shows the measured value. This field can be edited.
5	Read	Reads the measured value. Press "Read". (Only when Verification Tool is online to AXF)

(A) AXFA11 Remote Converter

(B) AXFA14 Remote Converter or AXF Integral Flowmeter

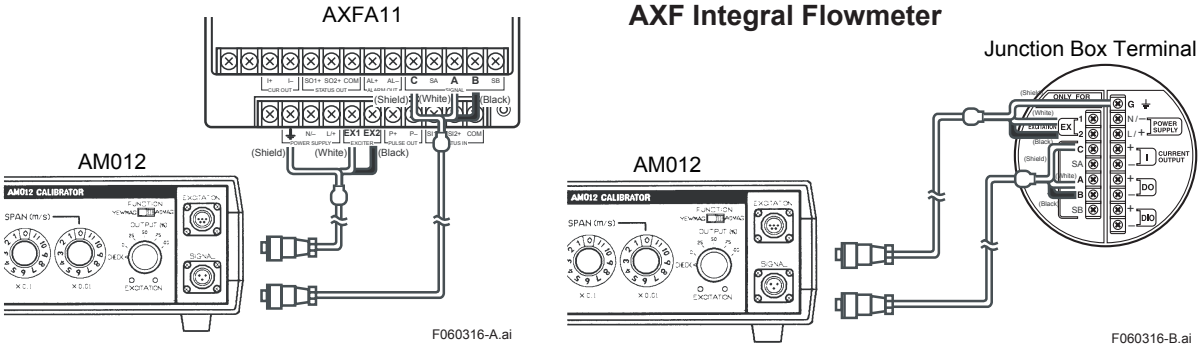


Figure 6.3.16 "Converter" Connection Diagram

1) For details of the calibration procedures, follow User's Manual FY2-XJAM012-40-2E.

Record the following original parameters and set the AXF parameters as shown below manually. (These settings are described in FY2-XJAM012-40-2E.)

Table 6.3.10 AXF parameter setting of Converter Check

HART Parameter (DD)		Parameter of AXF Display	Setting Value
Select Flow Tube (*1)	Device setup → Detailed Setup → Basic Setup →Select Flow Tube	C30	Calibrator
Nominal Size	Device setup → Detailed Setup → Basic Setup →Nominal Size	C32	Enter flowtube nominal size in "mm" unit
Nominal Size	Device setup → Detailed Setup → Basic Setup →Nominal Size unit	C31	mm
MF Set	Device setup → Detailed Setup → Basic Setup→MF Set	C20 (Measure Mode)	Standard DF or Enhanced DF (*3)
Low MF	Device setup → Detailed Setup → Basic Setup→MF Set → Standard DF → Low MF	C21	1.0
High MF	Device setup → Detailed Setup → Basic Setup→MF Set → Standard DF → High MF	C22	1.0
Low MF (EDF) (*2)	Device setup → Detailed Setup → Basic Setup→MF Set → Enhanced DF → Low MF (EDF)	C23	1.0
High MF (EDF) (*2)	Device setup → Detailed Setup → Basic Setup→MF Set → Enhanced DF → High MF (EDF)	C24	1.0

*1: Only for AXFA11
*2: Only for optional code HF1 or HF2 (Enhanced Dual Frequency Excitation)
*3: Only for optional code HF1 or HF2, select "Enhanced DF".

2) Enter the span on the "Converter" screen.

2)-1 When Verification Tool is in "online" mode:
Click "Read Span (3)" in **Figure 6.3.15**. The value of parameter "Velocity Check" is entered automatically. If the AXF parameters are different from those in **Table 6.3.10**, the following error message is displayed. Set the AXF parameters to those in **Table 6.3.10**.

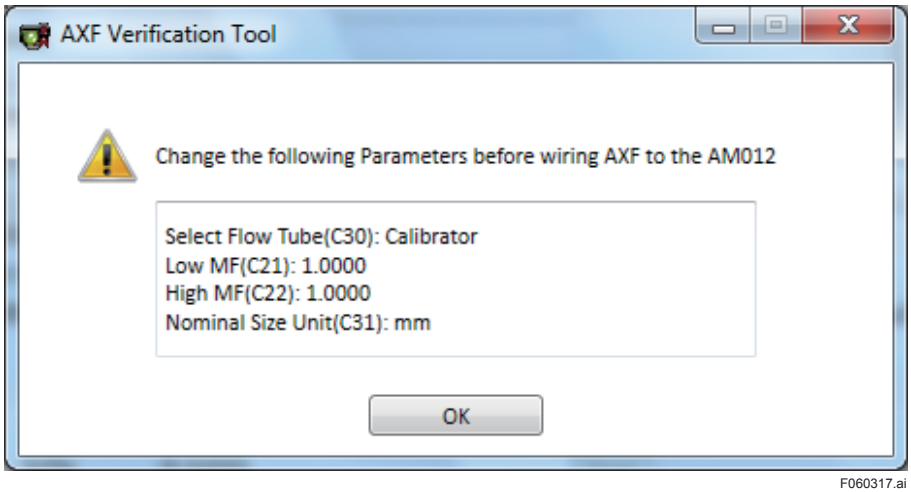


Figure 6.3.17 Example of "Parameter Error" Dialog

2)-2 When Verification Tool is in “offline” mode:
Read the value of parameter “Velocity Check” manually. Refer to **Table 6.3.11**. And enter the value in “cell (2)” in **Figure 6.3.15** manually.

Table 6.3.11 AXF Parameter Settings of Converter Check

HART Parameter (DD)		Parameter of AXF Display
Velocity Check	Device setup → Detailed Setup → Basic Setup →Velocity Check	C44

3) Measure the output accuracy at the preferred setting (0%, 25%, 50%, 75%, or 100%). After setting the value, let the AM012 stabilize at least for 1 minute.

For operation procedure, follow User’s Manual FY2-XJAM012-40-2E.

4) Enter the measured value.

4)-1 When Verification Tool is in “online” mode:
Click “Read (5)” in **Figure 6.3.15**. The value of instantaneous flow rate is entered automatically.

4)-2 When Verification Tool is in “offline” mode:
Read the value of parameter “PV” or “PV %rnge” manually. Refer to **Table 6.3.12**, and convert the value in “m/s” unit.

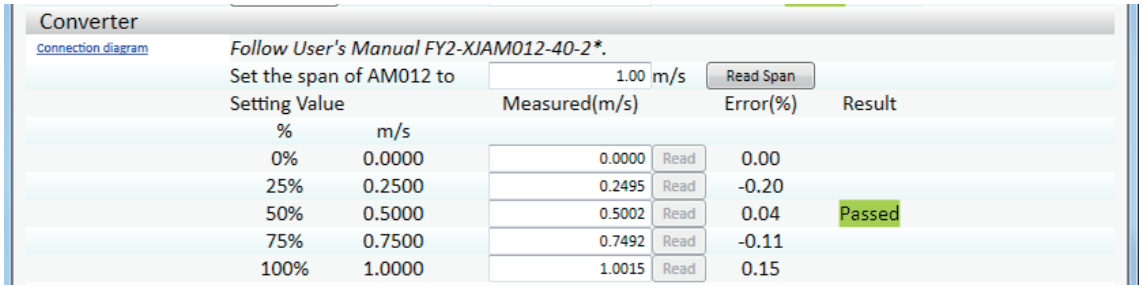
Enter the calculated value in “cell (4)” in **Figure 6.3.15** manually.

Table 6.3.12 AXF Measured Value of “Converter” Check

HART Parameter (DD)		Parameter of AXF Display
PV	■ Process Variables → PV or ■ Device Status → Process Variable → PV	A20
PV %rnge	■ Process Variables → PV %rnge or ■ Device Status → Process Variable → PV %rnge	A10

5) “Error (%)” is calculated automatically.

6) “Result” is displayed automatically after filling in all fields.



F060318.ai

Figure 6.3.18 “Converter” Result

7) Set the AXF parameters back to their original values manually.

6.3.4 Insulation Resistance

WARNING

Follow User's Manual IM 01E20D01-01E for correct operational and safe handling.

Where the insulation resistance check is not possible, select "N/A"

1) Check the insulation resistance in the terminal box in accordance with the tables below. Follow User's Manual IM 01E20D01-01E.

(A) Coil

Table 6.3.13 Coil Insulation Resistance Check

Test Terminals	Test Voltage
Between terminals EX1 and C	500 V DC (Use an insulation tester or equivalent.)

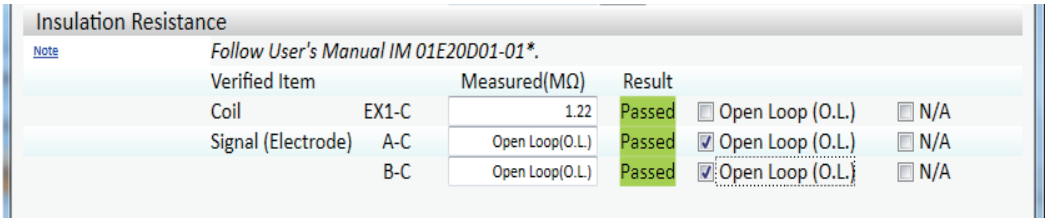
(B) Signal (Electrode)

Table 6.3.14 Electrode Insulation Resistance Check

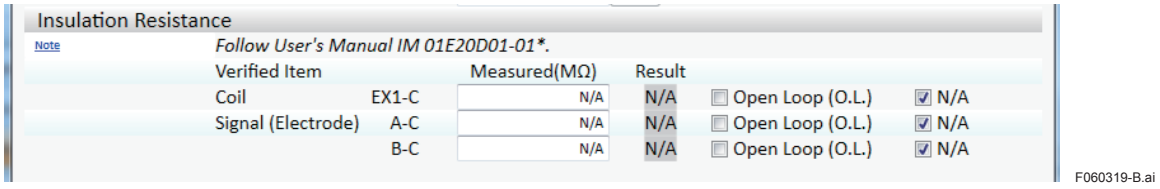
Test Terminals	Test Voltage
- Between terminals A and C - Between terminals B and C	500 V DC (Use an insulation tester or equivalent.)

2) Enter the measured value manually.
Where the insulation resistance check is not possible, select "N/A".
Where the measured value is over-range, select "Open Loop (O.L.)".

3) "Result" is displayed automatically.



(A) Example 1

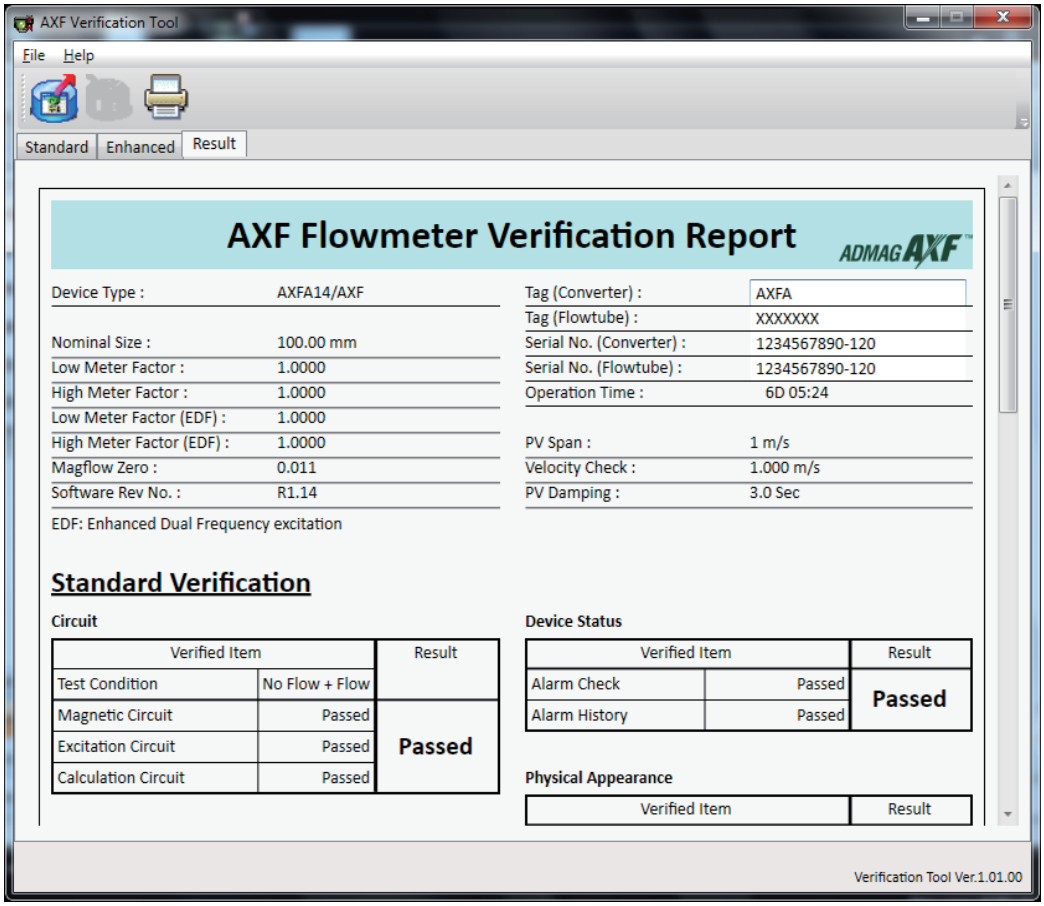


(B) Example 2

Figure 6.3.19 "Insulation Resistance" Result

6.4 Result

The results of Standard VF and Enhanced VF are available in the “Result” tab. Uncompleted check items are displayed as blank.

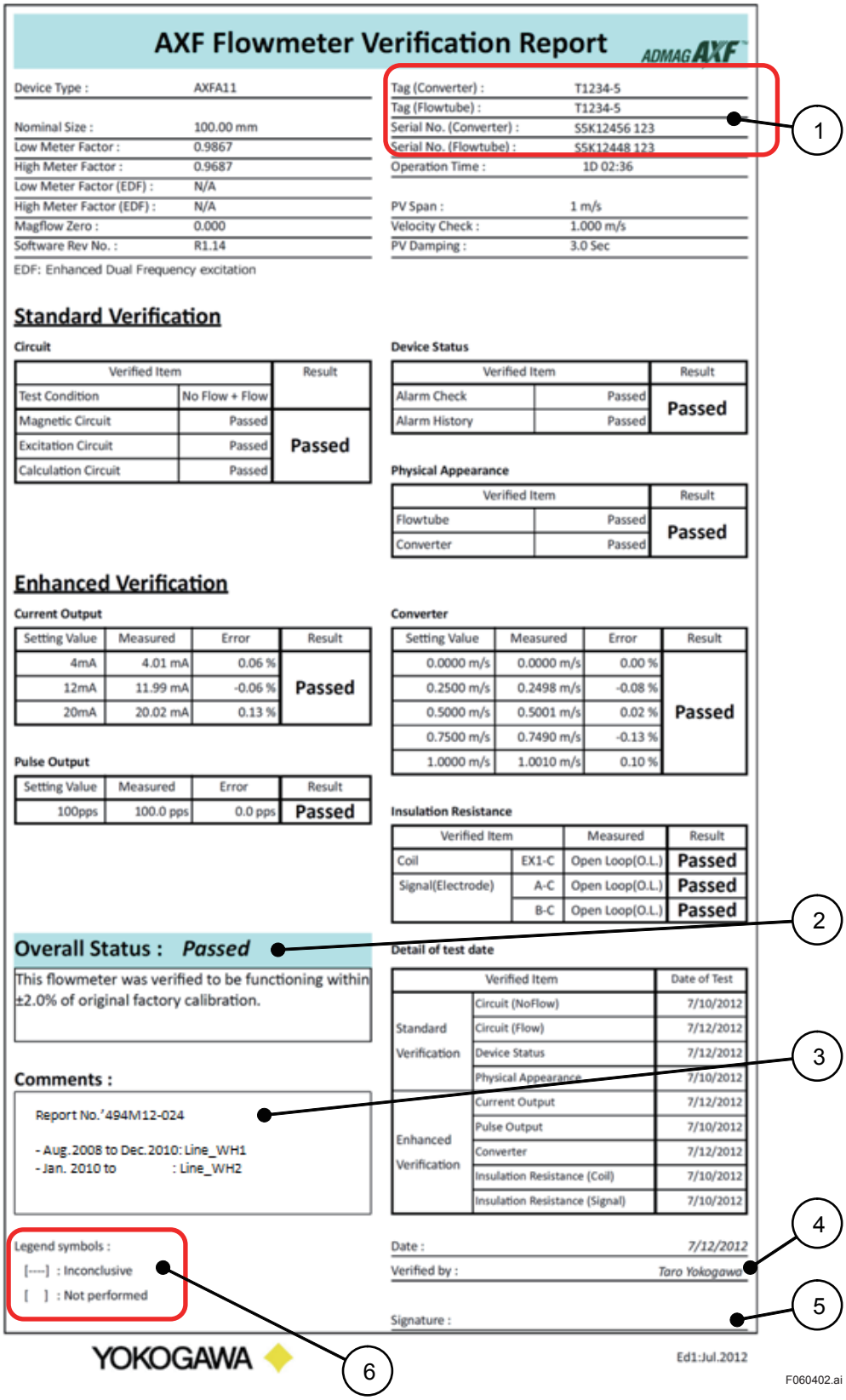


F060401.ai

Figure 6.4.1 “Result” Screen

The result in full view is shown **Figure 6.4.2.**

If the user needs a hard copy of the report, refer to Subsection 6.1.3.



AXF Flowmeter Verification Report

ADMAG AXF

Device Type :	AXFA11
Nominal Size :	100.00 mm
Low Meter Factor :	0.9867
High Meter Factor :	0.9687
Low Meter Factor (EDF) :	N/A
High Meter Factor (EDF) :	N/A
Magflow Zero :	0.000
Software Rev No. :	R1.14

EDF: Enhanced Dual Frequency excitation

Tag (Converter) :	T1234-5
Tag (Flowtube) :	T1234-5
Serial No. (Converter) :	S5K12456 123
Serial No. (Flowtube) :	S5K12448 123
Operation Time :	1D 02:36
PV Span :	1 m/s
Velocity Check :	1.000 m/s
PV Damping :	3.0 Sec

1

Standard Verification

Circuit

Verified Item		Result
Test Condition	No Flow + Flow	Passed
Magnetic Circuit	Passed	
Excitation Circuit	Passed	
Calculation Circuit	Passed	

Device Status

Verified Item		Result
Alarm Check	Passed	Passed
Alarm History	Passed	

Physical Appearance

Verified Item		Result
Flowtube	Passed	Passed
Converter	Passed	

Enhanced Verification

Current Output

Setting Value	Measured	Error	Result
4mA	4.01 mA	0.06 %	Passed
12mA	11.99 mA	-0.06 %	
20mA	20.02 mA	0.13 %	

Converter

Setting Value	Measured	Error	Result
0.0000 m/s	0.0000 m/s	0.00 %	Passed
0.2500 m/s	0.2498 m/s	-0.08 %	
0.5000 m/s	0.5001 m/s	0.02 %	
0.7500 m/s	0.7490 m/s	-0.13 %	
1.0000 m/s	1.0010 m/s	0.10 %	

Pulse Output

Setting Value	Measured	Error	Result
100pps	100.0 pps	0.0 pps	Passed

Insulation Resistance

Verified Item		Measured	Result
Coil	EX1-C	Open Loop(O.L.)	Passed
Signal(Electrode)	A-C	Open Loop(O.L.)	Passed
	B-C	Open Loop(O.L.)	Passed

2

Overall Status : *Passed*

This flowmeter was verified to be functioning within ±2.0% of original factory calibration.

Detail of test date

Verified Item		Date of Test
Standard Verification	Circuit (NoFlow)	7/10/2012
	Circuit (Flow)	7/12/2012
	Device Status	7/12/2012
	Physical Appearance	7/10/2012
Enhanced Verification	Current Output	7/12/2012
	Pulse Output	7/10/2012
	Converter	7/12/2012
	Insulation Resistance (Coil)	7/10/2012
	Insulation Resistance (Signal)	7/10/2012

3

Comments :

Report No.'494M12-024

- Aug.2008 to Dec.2010: Line_WH1
- Jan. 2010 to : Line_WH2

Legend symbols :

[----] : Inconclusive

[ ] : Not performed

6

Date : *7/12/2012*

Verified by : *Taro Yokogawa*

4

Signature :

5

YOKOGAWA

Ed1:Jul.2012

F060402.ai

Figure 6.4.2 "Result" in Full View

Table 6.4.1 Result

Item No.	Item Name	Description
1	Tag (Converter) Tag (Flowtube) Serial No. (Converter) Serial No. (Flowtube)	Shows AXF device information. The contents entered in General Information are displayed by default. This fields can be edited in the “Result” tab.
2	Overall Status	Shows the result of the whole verification. • Passed This flowmeter was verified to be functioning within +/- □% of the original factory calibration. • Failed This flowmeter did not pass the verification test.
3	Comments	Shows user comment. This item can be edited. Enter any comment (e.g. user’s document No.).
4	Verified by	Shows the name of the person who performed the verification. The name entered in General Information is displayed by default. This field can be edited in the “Result” tab.
5	Signature	Shows the signature of the person who performed the verification. The person should sign this field on the printout.
6	Legend symbols	Shows the meaning of symbols in “Result” fields. ● [----] : Inconclusive ● [ ] : Not performed

7 VARIATION OF VERIFICATION DATA

In terms of keeping its own data integrity, verification data cannot be copied, nor can it be saved as other name. Verification data except for “Locked data” can be saved only by newly saving or over-writing.

There are 3 types of verification data:

1. Installation data
2. Locked data
3. Others

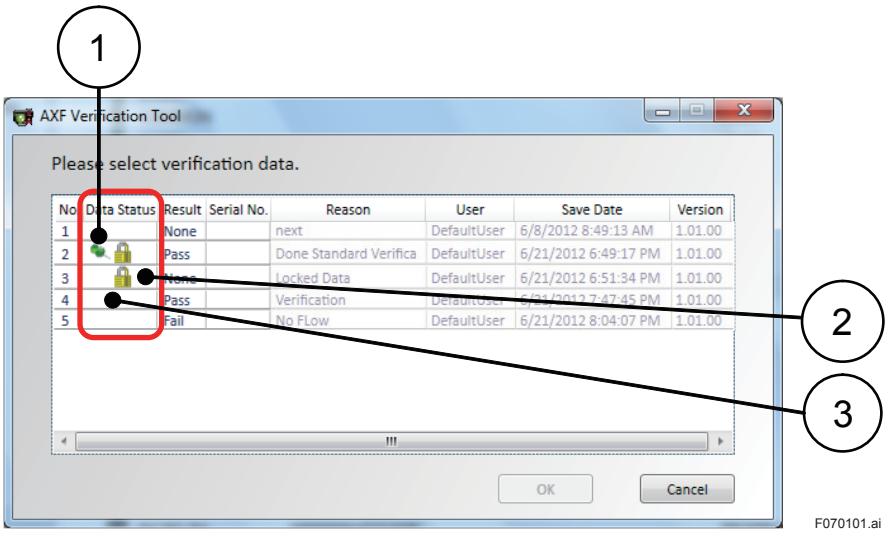

1
AXF Verification Tool
Please select verification data.
No. Data Status Result Serial No. Reason User Save Date Version
1 None next DefaultUser 6/8/2012 8:49:13 AM 1.01.00
2 Pass Done Standard Verifica DefaultUser 6/21/2012 6:49:17 PM 1.01.00
3 None Locked Data DefaultUser 6/21/2012 6:51:34 PM 1.01.00
4 Pass Verification DefaultUser 6/21/2012 7:47:45 PM 1.01.00
5 Fail No FLow DefaultUser 6/21/2012 8:04:07 PM 1.01.00
OK
Cancel
2
3
F070101.ai

Figure 7.1.1 Variation of verification data

Table 7.1.1 Variation of verification data

Item No.	Item Name	Icon	Description
1	Installation data		See Section 7.1.
2	Locked data		See Section 7.1 and Section 7.2.
3	Others		See Section 7.3.

7.1 Installation Data

“Installation data” functions as a reference. Each device can have only one “Installation data”. When the verification data is saved by checking the “Save as installation data” box in **Figure 6.1.9**, the data becomes the “Installation data”.

Only when “No Flow + Flow (*1)” is complete, verification data can be saved as an “Installation data”. See Subsection 6.1.2.

Save the first verification data after the delivery as “Installation data”. (Recommended)

When the user wants to edit “Installation data” later:
Save the verification data by checking only the “Saved as installation data” box in **Figure 6.1.9**. The icon in Data Status is “ ”.

When it is necessary to save installation data as read-only:
Save the verification data by checking the “Saved as installation data” box and the “Save as locked data box” in **Figure 6.1.9**. The icon in Data Status is “ ”.

*1: “No Flow + Flow”:
“Circuit” check and “Device Status” check for both “No Flow” and “Flow” conditions. Refer to Subsection 6.2.1.

7.2 Locked Data

"Locked data" is saved as read-only. The icon in Data Status is " ".

After verification data is saved as "Locked data", the data:

- can be loaded.
- can be printed out.
- cannot be over-written.

When verification is complete, save the verification data as "Locked data" to prevent unexpected over-writing or falsifying, before printing. (Recommended)

7.3 Others

Verification data which is neither "Installation data" nor "Locked data" can be edited. When verification is to be continued later, do not save as either "Installation data" or "Locked data".

8 TERMINATION

This chapter describes “Normal Termination” and “Unexpected Termination”.

IMPORTANT

Make sure to keep the AXF’s power on at least for 10 minutes after you finish the Verification Tool.

If you turn the power off immediately, some of the parameters may be changed to different values from original settimg.

8.1 Normal Termination

Select “File” - “Exit” or click the “Close” button at the upper-right corner of “Main Screen”.

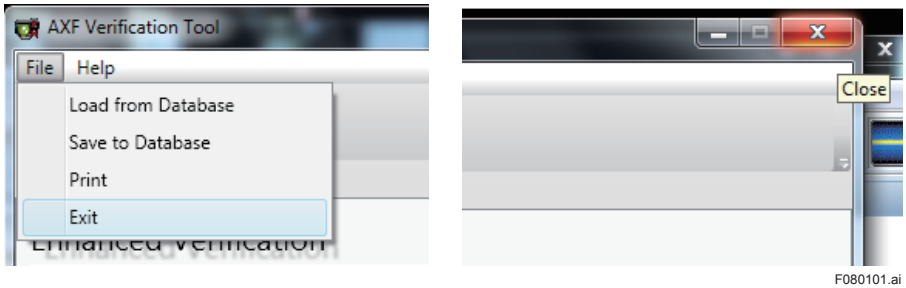


Figure 8.1.1 Normal Termination

8.1.1 When the verification data has not been changed after saving:

This tool is terminated without any dialogs appearing.

8.1.2 When the verification data has been changed after saving:

1) **Figure 8.1.2** is displayed.

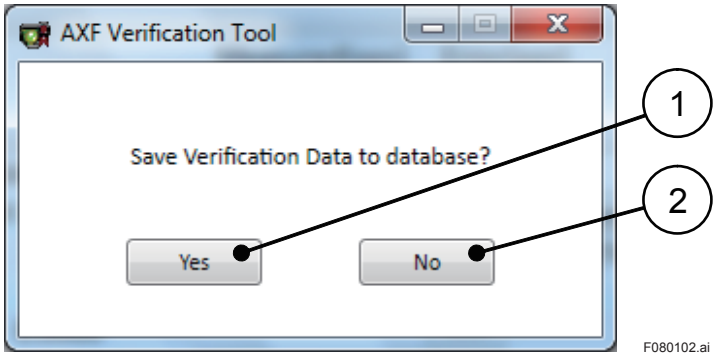


Figure 8.1.2 “Confirmation” Dialog

Table 8.1.1 “Confirmation” Dialog

Item No.	Item Name	Description
1	Yes	Saves the verification data by over-writing. See Subsection 6.1.2.
2	No	Cancels saving the data.

2) Select whether the latest verification data is saved to the database or not.

2)-1 To save the latest verification data:
Select “Yes (1)”. See Subsection 6.1.2.

2)-2 When the latest verification data is not saved:
Select “No (2)”. No dialogs appear and the data is not saved.

3) This Verification Tool is terminated automatically.

8.2 Unexpected Termination

If an unexpected termination occurs, follow this procedure.

1) When an unexpected termination occurs, be sure to re-connect FieldMate and AXF, and reboot Verification Tool. If the AXF parameters have been changed from the original setting, **Figure 8.2.1 “Error Recovery” Dialog** is displayed after reboot.

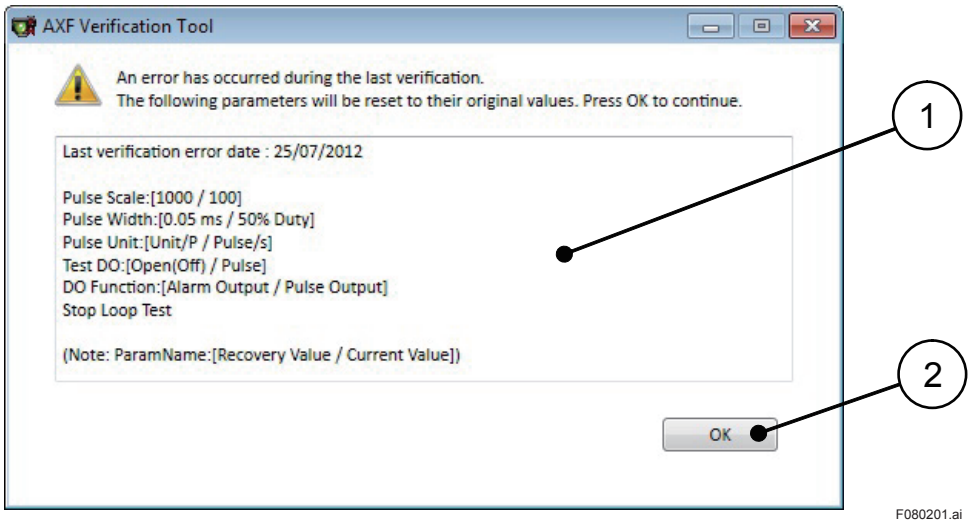

AXF Verification Tool
An error has occurred during the last verification.
The following parameters will be reset to their original values. Press OK to continue.
Last verification error date : 25/07/2012
Pulse Scale:[1000 / 100]
Pulse Width:[0.05 ms / 50% Duty]
Pulse Unit:[Unit/P / Pulse/s]
Test DO:[Open(Off) / Pulse]
DO Function:[Alarm Output / Pulse Output]
Stop Loop Test
(Note: ParamName:[Recovery Value / Current Value])
OK
1
2
F080201.ai

Figure 8.2.1 “Error Recovery” Dialog

Table 8.2.1 “Error Recovery” Dialog

Item No.	Item Name	Description
1	Error contents	Shows “Last verification error date” and “Parameter items which will be recovered”.
2	OK	Resets the AXF internal parameters to their original values. Click “OK (2)”.

2) To reset the AXF parameters to their original values, click “OK (2)”. **Figure 8.2.2** is displayed and then the AXF parameters are recovered.

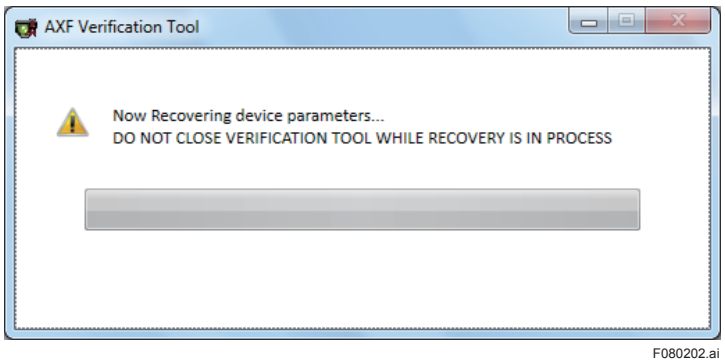

AXF Verification Tool
Now Recovering device parameters...
DO NOT CLOSE VERIFICATION TOOL WHILE RECOVERY IS IN PROCESS
F080202.ai

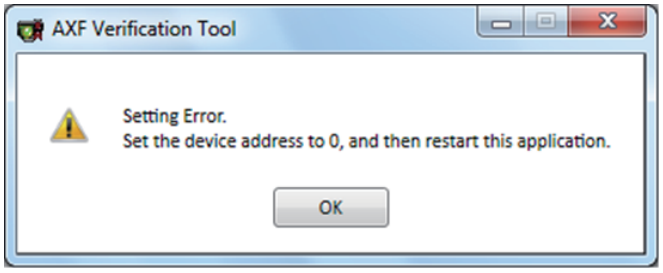
Figure 8.2.2 “Recovering” Screen

9 COMMUNICATION ERROR

9.1 Error Message

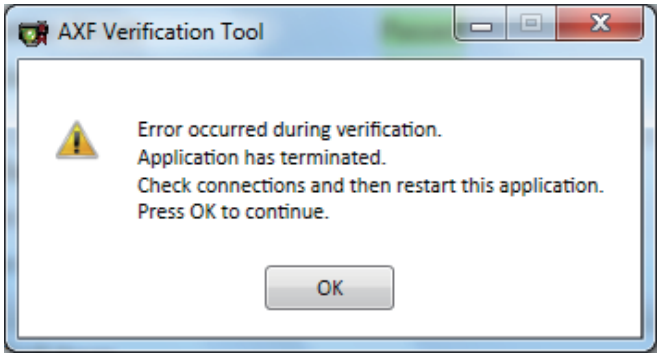
This chapter shows error dialogs. See **Table 9.1.1** for details.

After termination, follow Section 8.2.



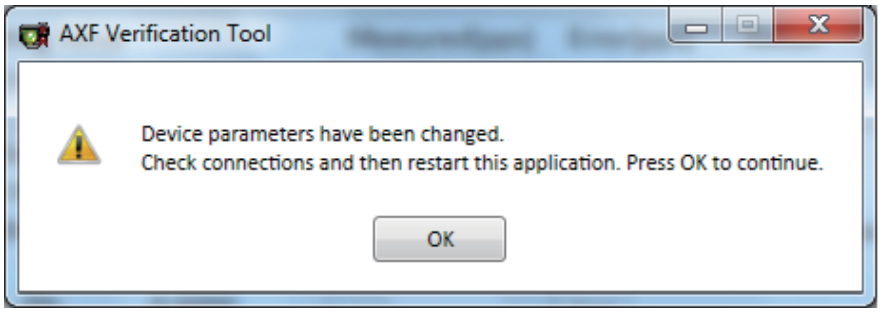
F090101.ai

Figure 9.1.1 Error Dialog 1



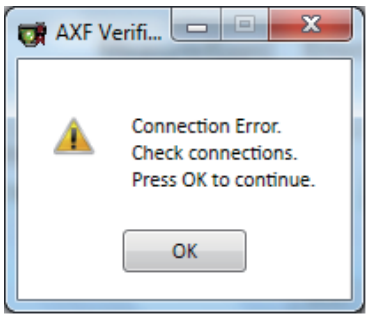
F090102.ai

Figure 9.1.2 Error Dialog 2


AXF Verification Tool
Device parameters have been changed.
Check connections and then restart this application. Press OK to continue.
OK

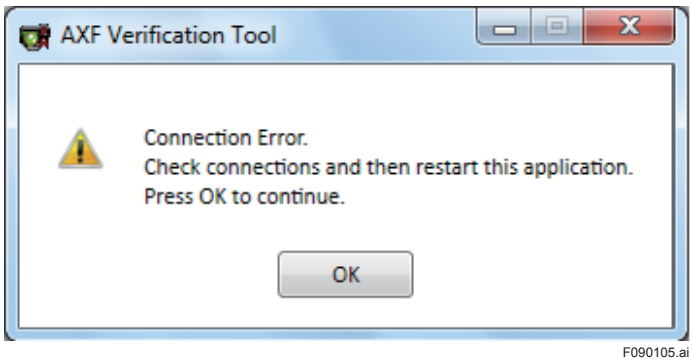
F090103.ai

Figure 9.1.3 Error Dialog 3



F090104.ai

Figure 9.1.4 Error Dialog 4



F090105.ai

Figure 9.1.5 Error Dialog 5

Table 9.1.1 Communication Error Dialog

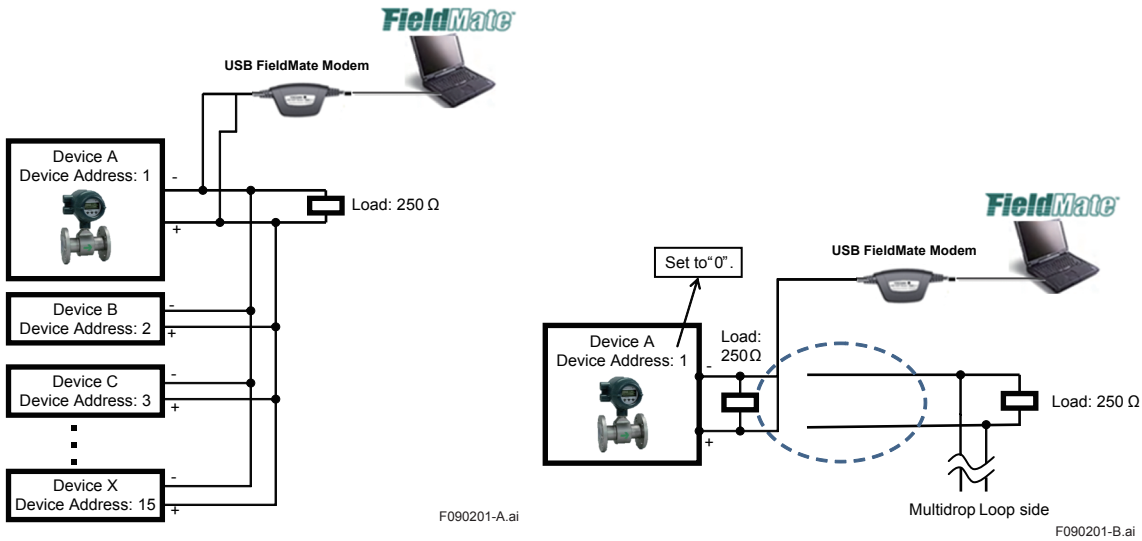
Figure No.	Message	When	Description
9.1.1	Setting Error. Set the device address to 0, and then restart this application.	■ When starting Verification Tool from “Segment Viewer” with status where FieldMate is online to AXF whose device address is not “0”.	■ If the user wants to run Verification Tool with status where Verification Tool is in “online” mode: Follow Section 9.2. ■ If Verification Tool need not be in “online” mode: Restart Verification Tool from “Device Navigator”, “Device Info”, or “History”.
9.1.2	Error occurred during verification. Application has terminated. Check connections and then restart this application. Press OK to continue.	■ During running “Circuit” check or “Device Status” check. ■ During setting pulse output.	After this dialog, **Figure 8.1.2** is displayed and the tool is terminated. As AXF parameters might have changed, follow Section 8.2.
9.1.3	Device parameters have been changed. Check connections and then restart this application. Press OK to continue.	■ During running “Current Output” or “Pulse Output”.	After this dialog, **Figure 8.1.2** is displayed and the tool is terminated. As AXF parameters might have changed, follow Section 8.2.
9.1.4	Connection Error. Check connections. Press OK to continue.	■ During preparing “Circuit” check or “Device Status” check after clicking “Start Verification” in Standard VF. Upon clicking; ■ “Output” in Output Selection ■ “Exit” in Output Selection ■ “Read Span” in Converter ■ “Yes” in **Figure 8.2.1**.	After this dialog, the tool returns to the previous step.
9.1.5	Connection Error. Check connections and then restart this application. Press OK to continue.	■ During launching “Verification Tool” ■ During recovery of AXF parameters after unexpected termination (**Figure 8.2.2**)	After this dialog, the tool is terminated. As AXF parameters might have changed, follow Section 8.2.

9.2 Device Address Setting

WARNING

This operation must be carried out by the trained personnel having knowledge of multidrop loop. For the details of the parameter setting procedure, refer to IM 01E20C01-01E or IM 01E20C02-01E. After using Verification Tool, set the AXF to the original multidrop loop.

9.2.1 Multidrop Mode Canceling



(A) Multidrop loop **(B) After canceling Multidrop loop**

Figure 9.2.1 Configuration

1) Disconnect the target device (AXF) from the multidrop loop physically.
2) Connect the AXF to FieldMate one to one. A load of 250Ω is required. See **Figure 9.2.1 (B)**.
3) Record the following original AXF parameter, and then set the parameter as shown.

Table 9.2.1 Parameter of Cancelling Multidrop mode

HART Parameter (DTM)		Setting Value
Poll Addr	Configuration → HART → Poll addr	0

4) Start Verification Tool.

9.2.2 Multidrop Mode Setting

After using Verification Tool, set the AXF back to its original status.

1) After Verification Tool termination, set the AXF parameter back to its original value manually.

Table 9.2.2 Parameter Setting of Multidrop mode

HART Parameter (DTM)		Setting Value
Poll Addr	Configuration → HART → Poll addr	Original Value

2) Connect the AXF back to the original configuration.

Revision Information

AXF Verification Tool

Manual No.: IM 01R01A11-01EN

Edition	Date	Page		Revised Item
1st	Aug. 2012	-		New publication
2nd	Oct. 2014			Software updates for FieldMate from R2.05 to R3.01
		2-2	2.1	Corrected the Figure 2.1.1
		2-4	2.3	Corrected the Figure 2.3.1
		4-1	4	Corrected the Figure 4.1.1
		4-2 to 4-3	4.1	Changed the Figure 4.1.2 and Figure 4.1.3
				Added the Figure 4.1.4
		4-4 to 4-5	4.2	Changed the Figure 4.2.1 and Figure 4.2.2
				Added the Figure 4.2.3
		4-6	4.3	Changed the Section 4.3
				Deleted the Section 4.4
		6-12	6.2.1	Added the IMPORTANT
		8-1	8	Added the IMPORTANT